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Document Control: The manual will be reviewed annually and necessary amendments shall be documented .

Master Copy	Copy No 1	Medical Director
Controlled Copy	Copy No 2	Medical Superintendent
Controlled Copy	Copy No 3	Infection Control Officer

RECORDS OF AMMENDMENT

Amendment	Section	Page no	Date Issued	Date Amended
Entire document	1 to 21	1 to 191	4-01-2016	26-12-2015
Cover page		1	10-12-2016	15-11-2016
Biomedical waste Management	15.19.1 & 15.19.2.1	143-148	10-12-2016	15-11-2016
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1 GENERAL INFORMATION

1.1 INTRODUCTION

Hospital infection Control includes the prevention and management of infections in a hospital setting through the application of research based knowledge to practices that include: standard precautions, decontamination, waste management, surveillance and audit.

The overall aim of this document is to provide evidence based information in the prevention and control of infection at Hospital. Hospital infection control committee has been formed that will look after the infection control needs of the hospital.

It is relevant to all staff including doctors, nurses, other clinical professionals and managers working at HOSPITAL to help to fulfil their legal and professional obligations with regard to both communicable disease and infection control.

This document will be reviewed and updated by the Infection control committee, of the HOSPITAL

The hospital has an Infection control manual, which is reviewed and updated periodically, at least once a year.

1.2 OBJECTIVES

The manual identifies the high risk areas of the hospital. It outlines the methods of surveillance in the identified high risk areas, isolation policies and procedures.

- It focuses on adherence to standard precautions at all times.
- To develop an appropriate antibiotic policy.
- Defining the engineering controls to prevent infection.
- Defining the outbreaks and procedures for handling such outbreaks.
- Protocol for disinfection and sterilization processes.
- Guidelines for appropriate waste segregation and disposal.

1.3 REVIEW AND REVISION OF INFECTION CONTROL MANUAL

Written policies and procedures shall be reviewed at least once in a year.

Purpose

- To maintain infection control measures and minimize hospital acquired infections in patients and staff.
- To define policy and procedure regarding the infection control measures at the hospital.
- To frame antibiotic policy and monitor its adherence by the prescribing authorities.

1 Infection Control Program

A well designed, comprehensive and coordinated infection control programme aimed at reducing/eliminating risks to patients, visitors and providers of care is planned and implemented.

The programme aims at

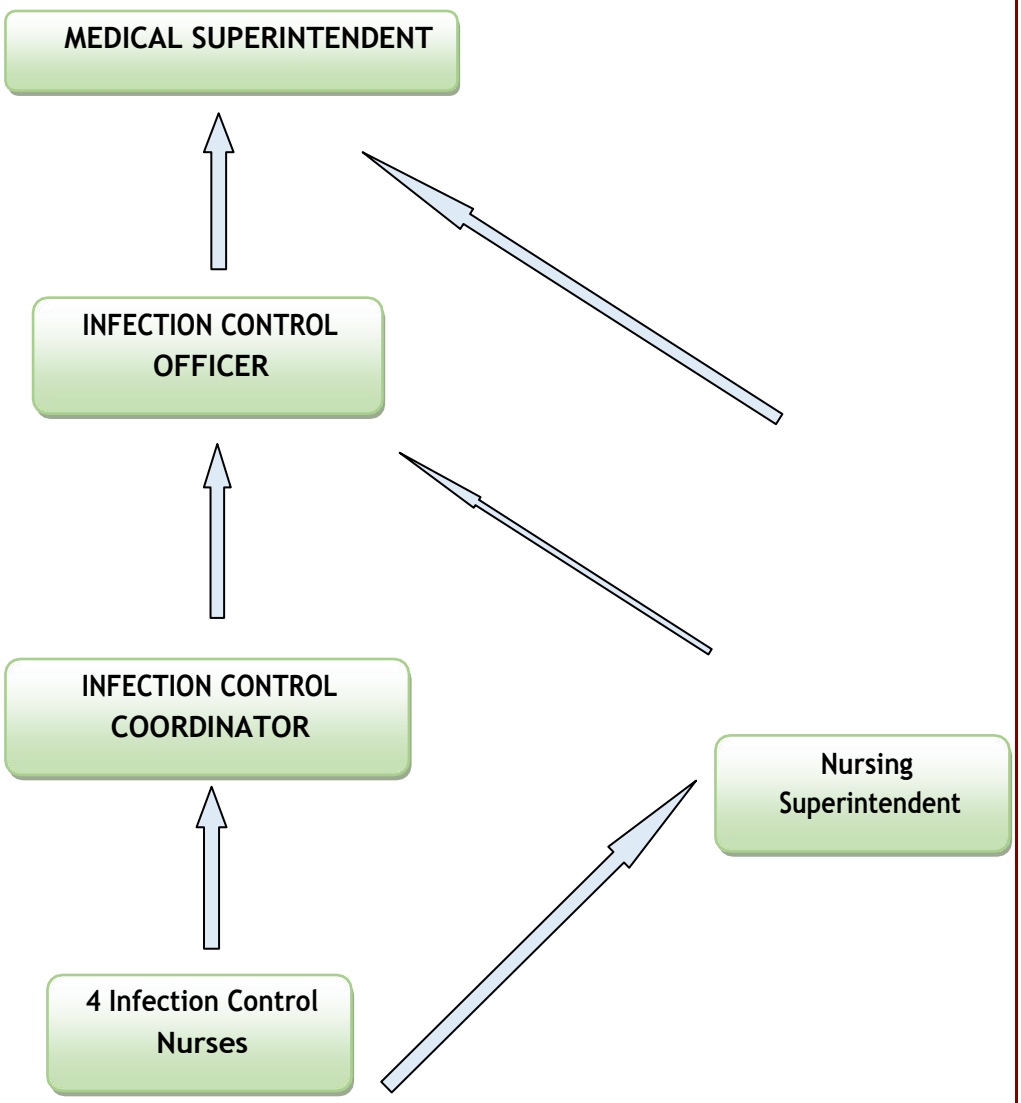
- Preventing and reducing risks of nosocomial infections
- Planning and implementing surveillance activities towards the identified areas.

2.1 REQUISITES OF THE PROGRAM

The management of the hospital shall ensure that the resources required for the infection control programme are made available in a sustained manner.

The management of the hospital shall ensure that a separate budget to be demarcated for HIC activities from the annual budget. The Infection Control Program is a method of preventing hospital-acquired infections.

2.1.2 ORGANOGRAM



POLICIES

There shall be an active infection control program.

Staff shall be made aware of infection control policies and procedures and their role in surveillance, prevention and control.

There shall be specific departmental infection control policies and procedures written for all hospital departments.

The prevention and control methods and surveillance strategies shall be evaluated for effectiveness throughout Hospital.

RESPONSIBILITIES

The Medical Superintendent

Approves the nominated chairperson and members of the Infection Control Committee.

Appoints a representative of Hospital management to be a member of the infection Control Committee.

Authorizes the Infection Control Committee to institute appropriate control measures and/or studies.

Encourages the participants of Hospital staff in the Infection Control Program.

Departments, Divisions, Units and Services

Develop, review, revise and propose infection control policies and procedures specific to their functions, in consultation with the microbiologist.

Submit proposed infection control policies to the microbiologist for review, comment and approval by the Infection control Committee.

Address preventive methods, which pertain to their function. Implement infection control policies and procedures within their area of responsibility.

Ensures that their personnel adhere to the Hospital Employee Health Program.

Inform the microbiologist of any potential or identified infection control problems.

Provide infection control in-service education to their personnel in conjunction with the microbiologist and Infection Control Nurse.

Infection Control Committee Representatives:

Provide personnel in their area with infection control activity reports in order to ensure staff awareness of current problems.

Nursing Staff

Adhere to the Infection control policies and procedures.

Know the nursing functions essential to the prevention, recognition and management of infection.

Adhere to measures of Infection Control, including hand washing and isolation techniques.

Report any signs of infection to the attending physician/surgeon and record the findings in the nurse's notes.

Tracking & documentation of hospital acquired infection.

Monitoring compliance to hand hygiene & various HAI care bundles.

2.1.4.3.1.7 Alert Infection Control of suspected or confirmed infection problems.

Institute isolation or precautionary measures when an infectious disease is suspected; inform the attending physician/surgeon as soon as possible.

Participate, with Infection Control, in orientation and continuing education programs for infection control.

Adhere to the Hospital Employee Health Program.

2.2 INFECTION CONTROL COMMITTEE

Structure

The ICC is responsible for day-to-day infection control activities within Hospital. It consists of

CORE COMMITTEE MEMBERS

- Infection Control Officer - Chair man
- Medical Superintendent- Vice Chair man
- Infection Control Coordinator – Secretary
- Infection control Nurses

COMMITTEE MEMBERS

- Chief Intensivist
- OT in charge

- HOD , Medicine
- HOD , Surgery
- HOD , Anaesthesia
- HOD , Critical Care
- Surgeon , Orthopaedics
- Nursing superintendent
- Chief Estate Officer
- CSSD in charge
- MICU in charge Nurse
- SICU in charge Nurse
- PICU in charge Nurse
- NICU in charge Nurse
- Housekeeping in charge
- **Co-opted Members**
- Pharmacist
- Dietary in charge.
- Stores in charge
- Bio Medical Engineer

Functions of ICC

The ICC carries out the following functions:

Develops infection control policies and procedures in Hospital

The ICC acts as a source of expertise on matters relating to infection control:

To ensure that corrective action and control measures are taken in the event of outbreaks of infection.

Continued surveillance of hospital acquired infections

Monitors functional compliance with infection control policies and procedures.

Develops educational program about infection control policies and practices for Hospital staff**.**

Reviews hospital infection control policies and procedures every year.

Designs and determines the type of surveillance and reporting programs.

Assigns responsibility to an individual or a department to carry out actions or recommendations.

Monitors the HAI rates & Crude infection rates and doing a trend analysis.

Develops antibiotic policy appropriate to the organization

Frequency of Meeting

The Infection Control Committee meets regularly during the second Friday of every month. All meetings of the committee should have a quorum of at least four members. New members will be chosen if necessary.

Responsibilities

2.2.7.1 **Medical Superintendent :**

The Medical Director is the Vice Chairperson of the Infection Control Committee.

He coordinates with the Head of the department of Hospital infection control for effective functioning of the committee.

Responsibilities:

2.2.7.1.1 Convenes meeting of the Infection Control Committee not less than monthly; more often if necessary.

If an urgent matter arises, assembles as many members of Infection Control Committee as possible, but not less than the following:

Him/herself.

- Infection Control Nurse.
- The chief of the concerned department service.
- Any other directly concerned with the matter.

Serves as a permanent core member of the Infection Control Committee.

Coordinates the field-wide implementation of the Hospital Infection Control Program.

Supervises the accurate collection of infection control data and participation in the analysis of the data; prepares summary report for the Infection Control Committee.

Informs Hospital staff of new developments in infection control and acts as a professional resource regarding state-of-the-art development.

Conducts prospective prevalence studies periodically to evaluate the effectiveness of the surveillance system.

Serves on or consults with committee in-charge with evaluating procedures or equipment, which has an impact on infection control activities.

Coordinates and assists with employee orientation and in-service education program related to infection control.

Collaborates with all departments in the development, review and revision of infection control manual.

Acts as a consultant regarding infection control issues.

Infection Control Nurse

Records and distributes minutes of the meetings of Infection Control Committee.

Formal minutes will be circulated to all members of the Infection Control Committee and others as appropriate.

Minutes will reflect decisions taken, recommendations made, status of activities in progress and implementation status of recommendations.

2.2.7.3 Physician /HOD Microbiology

Physicians have unique responsibilities for the prevention and control of hospital infections:

By providing direct patient care using practices which minimize infection by following appropriate practice of hygiene (e.g. hand washing, isolation)

Serving on the Infection Control Committee, supporting the infection control team.

Protecting their own patients from other infected patients and from hospital staff who may be infected.

Complying with the practices approved by the Infection Control Committee.

Obtaining appropriate microbiological specimens when an infection is present or suspected.

Notifying cases of hospital-acquired infection to the team, as well as the admission of infected patients.

Complying with the recommendations of the Antimicrobial Use Committee regarding the use of antibiotics.

Advising patients, visitors and staff on techniques to prevent the transmission of infection.

Instituting appropriate treatment for any infections they themselves have, and taking steps To prevent such infections being transmitted to other individuals, especially patients.

2.2.7.4 Pharmacist

The hospital pharmacist is responsible for:

Obtaining, storing and distributing pharmaceutical preparations using practices which limit potential transmission of infectious agents to patients.

Dispensing anti-infectious drugs and maintaining relevant records (potency, incompatibility, conditions of storage and deterioration)

Obtaining and storing vaccines or sera, and making them available as appropriate.

Maintaining records of antibiotics distributed to the medical departments.

Providing the Antimicrobial Committee and Infection Control Committee with summary reports and trends of antimicrobial use.

Should have the following information on disinfectants, antiseptics and other anti- infectious agents:

- Active properties in relation to concentration, temperature, length of action, antibiotic spectrum.
- Toxic properties including sensitization or irritation of the skin and mucosa.
- Substances that are incompatible with antibiotics or reduce their potency.
- Physical conditions which unfavorably affect potency during storage: temperature, light, humidity.
- Harmful effects on materials.

2.2.7.5 CSSD In charge

A central sterilization department serves all hospital areas, including the operating suite. An appropriately qualified individual shall be responsible for management of the program.

Senior Technician in charge of CSSD will be responsible for day-to-day management .The responsibilities of the *central sterilization service* are

To clean, decontaminate, test, prepare for use, sterilize, and store aseptically all sterile hospital equipment.

It works in collaboration with the Infection Control Committee and other hospital programs to develop and monitor policies on cleaning and decontamination of reusable equipment, contaminated equipment including wrapping procedures, according to the type of sterilization, sterilization methods according to the type of equipment, sterilization conditions (e.g. temperature, duration, pressure, and humidity).

The *director of this service* must:

Oversee the use of different indicators — physical, chemical, and bacteriological, to monitor the sterilization process.

Ensure technical maintenance of the equipment according to required standards and manufacturers' recommendations.

Report any defect to administration, maintenance, infection control and other appropriate personnel.

Maintain complete records of each autoclave run, and ensure long-term availability of records, collect or have collected, at regular intervals.

Ensure periodical calibration [once in six months] and validation [yearly] of sterilization instruments in coordination with the Biomedical Engineer.

Ensure AMC of the sterilization equipment's in coordination with the Biomedical Engineer.

2.2.7.6 Dietician

The *dietary in charge must* be knowledgeable in food safety, staff training, storage and preparation of foodstuffs, job analysis, and use of equipment.

The *head of catering services* is responsible for:

Defining the criteria for the purchase of foodstuffs, equipment use, and cleaning procedures to maintain a high level of food safety.

Ensuring that the equipment used and all working and storage areas are kept clean.
Issuing written policies and instructions for hand washing, clothing, staff responsibilities and daily disinfection duties.

Ensuring that the methods used for storing, preparing and distributing food will avoid contamination by microorganisms.
Issuing written instructions for the cleaning of dishes after use, including special considerations for infected or isolated patients where appropriate.
Ensuring appropriate handling and disposal of wastes.
Establishing programs for training staff in food preparation, cleanliness, and food safety.

2.2.7.7 Housekeeping in charge

The housekeeping service is responsible for the regular and routine cleaning of all surfaces and maintaining a high level of hygiene in the facility.

In collaboration with the Infection Control Committee it is responsible for:

2.2.7.7.1 Classifying the different hospital areas by varying need for cleaning

Developing policies for appropriate cleaning techniques— procedure, frequency, agents used, etc., for each type of room, from highly contaminated to the most cleanly, and ensuring that these practices are followed.

Developing policies for collection, transport and disposal of different types of waste (e.g. containers, frequency).

Ensuring that liquid soap and paper towel dispensers are replenished regularly.

Informing the maintenance service of any building problems requiring repair: cracks, defects in the sanitary or electrical equipment, etc.

Pest control (insects, rodents).

Providing appropriate training for all new staff members and, periodically, for other employees, and specific training when a new technique is introduced.

Establishing methods for the cleaning and disinfection of bedding (e.g. mattresses, pillows).

Determining the frequency for the washing of curtains, screening curtains between beds, etc.

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There shall be a continuing program for staff training. This program shall stress personal hygiene, the importance of frequent and careful washing of hands, and cleaning methods (e.g. sequence of rooms, correct use of equipment, dilution of cleaning agents, etc.). Staff will also understand causes of contamination of premises, and how to limit this, including the method of action of disinfectants. Training schedule has been formulated. [Annexure -1]

Authority

The Infection Control Committee will authorize appropriate Infection Control measures and forward recommendations to The Medical Director, as follows:

The Infection Control Committee shall make recommendations regarding appropriate infection control measures to units, divisions or departments, as applicable, and shall provide any necessary assistance in implementing such recommendations.

If there is disagreement regarding the implementation of a recommendation, the Infection Control Committee, through the Chairperson, shall discuss the recommendation with the appropriate department head. If the issue remains unresolved, the Infection Control Committee shall present the issue, through its representative, to the Medical Director for resolution.

If there is disagreement regarding the implementation of an urgent recommendation, I/D Physician, or his/her designee, shall immediately present the issue to the Infection Control Committee.

2.3 INFECTION CONTROL TEAM

2.5.1 Definition

The Infection Control Team is a sub-committee of the Infection Control Committee.

Membership of the Infection Control Team as follows:

- Infection Control Officer
- Infection Control Co-ordinator

- Infection Control Nurses
- Representatives from other disciplines or areas, as appropriate, and as determined by the Chairman, Infection Control Committee. The Medical Superintendent is usually informed when a serious problem arises.

Responsibilities

Hospital Management

Authorizes the Infection Control Team to review and recommends appropriate prevention and control measures

Infection Control Committee

i. Review the findings of the Infection Control Team.
ii. Approve appropriate action and control measures.

2.5.2.3 Head of the Department, Hospital Infection Control/Infection Control Officer

2.5.2.3.1 Convene meeting of the Infection Control Committee as follows:

a. When a potential or actual problem is identified.
b. When requested by a specific area.
c. Periodically for a general review.

Advice and reportto the Medical Director on all matters relating to infection control.

Develop and improve infection control policies and procedures for Hospital.

Organize the Infection Control Committee.

To supervise implementation of surveillance and audit.

To supervise infection control training activities for the health care workers.

Developing guidelines for appropriate collection, transport, and handling of specimens.

To ensure safe laboratory practice to prevent infections in staff.

To supervise sterilization, disinfection practices and to ensure clean and safe environment in the hospital.

Timely communication of results to the Chairperson, Infection Control Committee

To ensure epidemiological typing of hospital microorganisms where necessary.

To identify outbreak situations in the hospital and take necessary action and precautions to contain the outbreak in the earliest.

To develop and to periodically review hospital employee health program.

Infection Control Coordinator

To assist and coordinate to convene meeting of infection control committee

To supervise the Infection control Nurse for infection control activities.

To assist HOD in developing and improving infection control policies & procedure for hospital.

To implement surveillance and audit.

To provide adequate infection control training for the staff.

To assist HOD in developing guidelines for appropriate collection, transport and handling of specimen by the health care workers.

Ensuring safe laboratory practice to prevent infections in staff.

Monitoring sterilization, disinfection and the general cleanliness of the hospital.

Timely communication of the results to the HOD.

To develop and reviewing of hospital employee health program.

2.5.2.5 Infection Control Nurses (ICN)

There are four infection control nurses for the hospital.

The ICN provides assistance to the Infection Control team for the prevention and control of infection in the hospital.

To conduct day to day surveillance in detecting and investigating suspected nosocomial infections on a systematic and current basis.

Investigates all significant infection control problems in the hospital.

Supervise notification of Infectious diseases to the higher authority.

Initiates follow-up cultures on patients and contacts when indicated, and recommends other studies, as required, to confirm or rule out a suspected infection on the advice of the infection control officer.

Assists in the development and the annual review and revision of infection control policies and procedures and monitor their implementation.

Inspects the environment and observes personnel activities for the purpose of detecting possible infection hazards and evaluating compliance with standards set by the Infection Control Committee.

Routinely monitors compliance with hospital policy on isolation of patients with community-acquired or nosocomial infections, which require special care.

Coordinates and assists with employee orientation and in-service education programs related to infection control.

Follow-up of all infections in hospital personnel and assists in the development of the Hospital Employee Health Program.

Collaborates with the clinician and nurses about the routine monitoring of the units, which are particularly vulnerable to infection problems.

Hospital has a policy to report reportable diseases to the local health authorities. For certain infections, even one case may be of extraordinary importance in the context of present day epidemiology. Every such case has to be considered significant by the public health authorities and immediate steps taken to find further cases and to prevent further infection. Dengue and cholera are examples.

Childhood vaccine preventable diseases are reportable since a case is evidence for inadequate immunization in the area of residence of children with such diseases. For the above reasons, reportable diseases shall be informed without delay and with complete residential address to the health authorities.

Acquired immune deficiency syndrome and Human Immunodeficiency Virus infection have recently been included in the list of reportable diseases by government directive. However

reporting is only for statistical purposes of determining the time-trend of prevalence. Moreover, strict confidentiality of the identity of the person is to be maintained, hence the report will not contain the identity of the individual.

Apart from the above SARS and Swine Flu are the very recent diseases which are highly infective and are essentially to be reported to the Governmental Health Authorities

3.1 Reporting Methodology

The HOD Microbiology, in coordination with the HICC Officer is responsible for reporting notifiable diseases to the Medical Officer of Health under the limits of BBMP [Bangalore Mahanagara Palike].

Thus the flow of information will be from the HOD Microbiology, to the Medical Record Officer from where information is reported on a specific format to the Medical officer of health (MOH).

The information will be dispatched once a week in the weekly reporting format as recommended by the BBMP health Officer through email to the website by scanning the hard copy duly filled by the Laboratory Director .[Annexure]

3.2 NOTIFIABLE DISEASES

1. Cholera
2. Plague
3. Chickenpox
4. Tuberculosis
5. Leprosy
6. Enteric fever

7. Meningitis
8. Diphtheria
9. Dengue haemorrhagic fever
10. Acute flaccid paralysis
11. Polio
12. Yellow Fever
13. Malaria
14. Rabies
15. HIV/AIDS
16. SARS
17. Swine Flu
18. Chikungunya
19. H1N1

In case of an epidemic:

1. Acute gastroenteritis
2. Viral hepatitis

3.3 NOTIFICATION TO THE INFECTION CONTROL TEAM

Notify the Infection Control Team Immediately When the Following Organism/Conditions

Are Confirmed,

- MRSA - plus site of colonization/infection
- Beta-Haemolytic Streptococcus Group A (*Streptococcus pyogenes*)
- *Pseudomonas aeruginosa* – multidrug resistant
- Acinetobacter spp. - multidrug resistant
- Enterococci – Vancomycin resistant
- Any other uncommon or unusual organisms
- Hepatitis B and C
- Human Immunodeficiency Virus (HIV)
- SARS
- Swine Flu

4 Health Care Associated infections

4.1 CDC defines an health care associated infection (HAI) as a localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s). There must be no evidence that the infection was present or incubating at the time of admission to the acute care setting.

CDC uses the generic term ‘health care associated infection (HAI)’ instead of ‘nosocomial infection’.

HAI may be caused by infectious agents from endogenous or exogenous sources. Endogenous sources are body sites, such as the skin, nose, mouth, gastrointestinal tract, or vagina that are normally inhabit ted by microorganisms. Exogenous sources are those external to the patient, such as patient care personnel, visitors, patient care equipment, medical devices, or the health care environment.

4.2 The hospital takes action to prevent four major HAI

- Catheter associated urinary tract infection (CAUTI)
- Ventilator associated pneumonia (VAP)
- Surgical site infection (SSI)
- Central line associated blood stream infection (CLABSI)

4.3 CATHETER ASSOCIATED URINARY TRACT INFECTIONS [CAUTI]

Urinary catheterization is a most common nosocomial UTI (80 %) followed by urinary instrumentation such as cystoscopy (20 %).

UTI are reported as catheter associated UTI in a patient with an indwelling urinary catheter that has been in situ for > 48 hours duration.

Catheter associated UTI can lead to complications like cystitis, pyelonephritis etc. and also less commonly meningitis, endopthalmitis, septic arthritis etc.

Based on the presence or absence of symptoms, CAUTI can be classified as symptomatic and asymptomatic UTI.

4.3.1 Symptomatic Urinary Tract Infection

4.3.1.1 Definition: A Symptomatic urinary tract infection must meet at least one of the following criteria:

Criterion 1: PATIENT HAS ATLEAST ONE OF THE FOLLOWING SIGNS OR SYMPTOMS WITH NO OTHER RECOGNISED CAUSE: FEVER (>38^{O}C), URGENCY, FREQUENCY, DYSURIA OR SUPRAPUBIC TENDERNESS AND

A patient has a positive urine culture that is $\geq 10^5$ microorganisms per cm^3 of urine with no more than two species of microorganisms.

Criterion 2: PATIENTS HAS AT LEAST TWO OF THE FOLLOWING SIGNS OR SYMPTOMS WITH NO OTHER RECOGNISED CAUSE: FEVER (>38^{O}C), URGENCY, FREQUENCY, DYSURIA OR SUPRAPUBIC TENDERNESS AND AT LEAST ONE OF THE FOLLOWING:

- Positive dipstick for leukocyte esterase and or nitrate
- Pyuria (urine specimen with $\geq$ 10 WBC mm^3 or $\geq$ WBC high power field of un spun urine)
- Organism seen on Gram stain of unspun urine.
- At least two urine culture with repeated isolation of the same uropathogen (gram-negative bacteria or S.saprophyticus) with $\geq 10^2$ colonies/ml in non-voided specimens
- $\leq 10^5$ colonies mL of a single uropathogen (gram negative bacteria or S.saprophyticus) in a patient being treated with an effective antimicrobial agent for a urinary tract infection
- Physician diagnosis of a urinary tract infection.
- Physician institutes appropriate therapy for a urinary tract infection

Criterion 3: PATIENT ≤1 YEAR OF AGE HAS AT LEAST ONE OF THE FOLLOWING SIGNS OR SYMPTOMS WITH NO OTHER RECOGNIZED CAUSE:

FEVER (Rectal temperature, >38^{O}C), HYPOTHERMIA (Rectal temperature <37^{O}C), APNEA, BRADYCARDIA, DYSURIA, LETHARGY OR VOMITING AND

Patient has a positive urine culture, which is $\geq 10^5$ microorganisms per cm^3 of urine with no more than two species of microorganisms.

Criterion 4: PATIENT $\leq$ 1 YEAR OF AGE HAS AT LEAST ONE OF THE FOLLOWING SIGNS OR SYMPTOMS WITH NO OTHER RECOGNIZED CAUSE: FEVER (Rectal temperature : >38^{O}C), HYPOTHERMIA (Rectal temperature, < 37^{O}C), APNEA, BRADYCARDIA, DYSURIA, LETHARGY, OR VOMITING AND

At least one of the following:

- Positive dipstick for leukocyte esterase and or nitrate
- Pyuria (urine specimen with $\geq$ 10WBC / mm^3 or $\geq$ WBC / high power field of un spun urine)
- Organism seen on Gram stain of un spun urine
- At least two urine culture with repeated isolation of the same uropathogen (gram-negative bacteria or S.saprophyticus) with $\geq 10^2$ colonies ml in non-voided specimens.
- $\leq 10^5$ colonies ml of a single uropathogen (gram negative bacteria or S.saprophyticus) in a patient being treated with an effective antimicrobial agent for a urinary tract infection.
- Physician diagnosis of a urinary tract infection.
- Physician institutes appropriate therapy for a urinary tract infection.

4.3.2 Asymptomatic Urinary Tract Infection

An asymptomatic bacteriuria must meet the following criteria:

- Patient has had an indwelling urinary catheter within 7 days before culture and
- Patient has a positive urine culture i.e, ≥ 10^5 microorganism per cc of urine with no more than 2 species of microorganisms
- Patient has no fever (≥ 38^0 c,) urgency, frequency, dysuria or suprapubic tenderness.

NOTE:

* A positive culture of a urinary catheter tip is not an acceptable lab test to diagnose UTI

* A clean catch Midstream urine sample is required.

4.4 HEALTH CARE ASSOCIATED PNEUMONIA

Health care associated pneumonia has been the second most common hospital-associated infection after that of the urinary tract and is defined as the inflammatory conditions of the lung parenchyma caused by infectious agents not present or incubating at the time of admission.

The primary risk factor for the development of hospital-associated bacterial pneumonia is mechanical ventilation (with its requisite endotracheal intubation) and can be characterized by its onset of hospitalisation– Early or Late.

Early onset pneumonia - occurs during the first 96 hrs of hospitalization and is often caused by non-multi-antimicrobial-resistant microorganisms such as Escherichia coli, Klebsiella spp., Proteus spp, S. pneumoniae , H. influenzae, and Oxacillin-sensitive S. aureus .

Late onset pneumonia - develops after 96hrs of hospitalization. Causative agents include gram negative bacilli or S.aureus including MRSA.

Viruses (influenza A & B, RSV) cause early or late onset pneumonia, whereas yeasts, fungi, Legionellae and P.jiroveci are usually pathogens of late onset pneumonia.

Ventilator associated pneumonia: is defined as pneumonia in persons who had a device to assist or control respiration continuously through a tracheostomy or by endotracheal intubation within 48hr period before the onset of infection, inclusive of weaning period.

Diagnosis

Traditional criteria for diagnosis have been fever, cough, and development of purulent sputum, in combination with radiologic evidence of a new or progressive pulmonary infiltrate, leukocytosis, a suggestive Gram's stain, and growth of bacteria in cultures of sputum, tracheal aspirate, pleural fluid, or blood.

Bronchoscopic techniques, e.g., quantitative culture of protected specimen brush (PSB) specimen, Bronchoalveolar lavage (BAL), and Protected BAL (PBAL). Because these techniques are invasive, they can cause complications such as hypoxemia, bleeding, or arrhythmia. Quantitative culture of endotracheal aspirate and non-bronchoscopic procedures that utilize blind catheterization of the distal airways, e.g., nonbronchoscopic-PBAL and nonbronchoscopic-PSB, were developed later and were shown to approximate the sensitivity and specificity of bronchoscopic technique.

SURGICAL SITE INFECTIONS [SSI]

Surgical site infections can be classified into 3 groups

4.5.1 Superficial Incision SSI

Definition

Infections occur within 30 days after the operative procedure & involve skin & subcutaneous tissue of the incision.

Criteria: Patient has at least one of the following:

- Purulent drainage from the superficial incision
- Organisms isolated form an aseptically obtained culture of fluid or tissue from the superficial incision.
- Presence of at least one of the signs of infection – pain or tenderness, localized swelling, redness or heat and superficial incision deliberately opened by surgeon and is culture positive or not cultured. A culture negative finding does not meet these criteria.
- Diagnosis of SSI by surgeon.

NOTE: There are two specific types of superficial surgical site infections:

i. Superficial incisional primary: Identified in the primary incision in a patient who has had an operation with one or more incisions. Eg: C- Section incision or chest incision for CABG

ii. Superficial Incisional Secondary: Identified in the secondary incision in a patient who has had an operation with more than one incision [eg: Donor site (leg) incision for CABG]

Reporting instructions

- Do not report a stitch abscess (minimal inflammation and discharge confined to the points of suture penetration) as an infection.
- Do not report a localized stab wound infection as SSI, instead report as skin (SKIN), or soft tissue (ST), infection, depending on its depth.
- Circumcision is not an NHSN operative procedure.
- Report infected burn wound as BURN.
- If the incisional site infection involves or extends into the fascia and muscle layers, report as a deep incisional SSI.
- Classify infection that involves both superficial and deep incision sites as deep incisional SSI.

4.5.2 Deep Incision SSI

Definition

Infections occurs within 30 days after the operative procedure ± implant*(90 days) is left in place and the infection appears to be related to the operative procedure.

AND involves deep soft tissues (e.g., facial and muscle layers) of the incision.

Criteria: Patient has at least one of the following:

- Purulent drainage form deep incisional but not from organ/space component.
- A deep incision spontaneously dehisces or is deliberately opened by a surgeon and is culture positive or not cultured when the patient has at least one of the following signs or symptoms:
- Fever (>38□C),
- Localized pain or localized tenderness .A culture negative finding does not meet these criteria.

- An abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiological examination.
- Diagnosis of a Deep Incisional SSI by surgeon.

NOTE: There are two specific types of deep surgical site infections:

i. Deep incisional primary: Identified in the primary incision in a patient who has had an operation with one or more incisions. Eg: C- Section incision or chest incision for CABG

ii. Deep Incisional secondary: Identified in the secondary incision in a patient who has had an operation with more than one incision [eg: Donor site (leg) incision for CABG]

Reporting instruction

Classify infection that involves both superficial and deep incision sites as deep incisional SSI.

4.5.3 Organ / Space SSI

Definition

An organ /space SSI involves any part of the body, excluding the skin incision, fascia, or muscle layer that is opened or manipulated during the operative procedure.

Criteria: Infections occurs within 30 days after the operative procedure ± implant (90 days) and the infection appears to be related to the operative procedure. And infection involves any part of the body, excluding the skin incision, fascia, or muscle layers operative procedure and patient has at least one of the following

- Purulent drainage from the organ/ space
- Organisms isolated form culture of fluid or tissue in the organ/space
- An abscess or other evidence of infection involving the organ/space is found on direct examination, during reoperation, or by histopathology or radiological examination

- Diagnosis of an organ/space SSI by surgeon.

*A nonhuman-derived object, material, or tissue (eg, prosthetic heart valve, nonhuman vascular graft, mechanical heart, or hip prosthesis) that is permanently placed in a patient during an operative procedure and is not routinely manipulated for diagnostic or therapeutic purposes.

BLOOD STREAM INFECTIONS (BSI):

Definition:

According to the definitions proposed by the CDC, health care associated BSI is defined in a patient with a clinically important blood culture positive for a bacterium or fungus that is obtained more than 48 hours after being admitted to the hospital.

Primary blood stream infections are classified as lab confirmed blood stream infection and clinical sepsis. Clinical sepsis may be used to represent primary blood stream infections in neonates and infants.

Lab confirmed blood stream infections

Criteria 1 & 2 can be used in any patient including those less than or equal to 1 year of age.

Lab confirmed blood stream infections must meet one of the criteria:

Patient has recognized pathogen cultured from blood that is not related to an infection at another site.

Patient has one or the following signs or symptoms:

Fever (rectal< 38^0C), chills, or hypotension and positive laboratory results are not related to an infection at another site and common skin contaminants eg, diphtheroids, Coagulase negative staphylococci including S.epidermidis, Viridans group streptococci etc is cultured from two or more blood cultures drawn on separate occasions within two days of each other.

Patient less than 1 year of age has at least one of the following symptoms

Fever (rectal, <38^{0}C), hypothermia (rectal,<37^{o}C),apnea or bradycardia and common skin contaminants eg, Diphtheroids, Coagulase negative staphylococci including S.epidermidis, Viridans group streptococci etc is cultured from two or more blood culture drawn on separate occasions within two days of each other.

Diagnosis

Significant growth of a microorganism (>15 cfu/ml) from the catheter tip, subcutaneous segment of the catheter, or catheter hub.

Specimen collection considerations

Blood specimens for culture should be obtained from 2 to 4 blood draws from separate venipuncture sites, (eg, right and left antecubital veins), not through a vascular catheter. These blood draws should be performed simultaneously or over a short period of time (ie, within a few hours).

Exit site infection

Erythemia or indurations within 2 cm of the catheter exit site, in the absence of concomitant within bloodstream infection (BSI) and without concomitant purulence.

Clinical exit site infection (or tunnel infection)

Tenderness, erythema or site indurations > 2 cm from the catheter site along the subcutaneous tract of a tunneled (e.g.< Hickman or broviac) catheter, in the absence of concomitant BSI.

Pocket infection

Purulent fluid in the subcutaneous pocket of a totally implanted intravascular catheter that might or might not be associated with spontaneous rupture and drainage or necrosis of the overlaying skin in the absence of contaminant BSI.

4.6.8 Infusate-related BSI

Concordant growth of the same organism from the infusate and blood cultures (preferably percutaneously drawn) with no other identifiable source of infection.

5 SURVEILLANCE OF HOSPITAL ASSOCIATED INFECTIONS

Surveillance is defined as "the ongoing systematic collection, analysis and interpretation of health data essential to planning, implementation and evaluation of the public health practice closely integrated with timely dissemination of this data to those who need to know.

The nosocomial infection rate in patients in a facility is an indicator of quality and safety of care. Nosocomial infection surveillance is a programme designed to investigate, control and prevent hospital acquired infections.

Key points in the process of surveillance for nosocomial infection rates are,

• Active surveillance (prevalence and incidence studies)

• Targeted surveillance (site-, unit-, priority-oriented)

• Appropriately trained investigators

• Standardized methodology

• Risk-adjusted rates for comparisons

5.3 OBJECTIVES OF SURVEILLANCE:

- Reducing the infection rates within health care facilities.
- Establishing endemic infection rates.

- Identifying outbreaks
- Identifying high risk patients.
- Convincing medical personnel to adopt recommended preventive practices.
- Evaluating control measures.

5.4 METHODS OF SURVEILLANCE

1. lab record scrutiny
    1. Infection control nurse examines the lab report daily and discusses with microbiologist.
    2. Infection control nurse then visits the relevant patient and gathers necessary information and determines whether it is hospital acquired/community acquired.
    3. Infection control nurse encourages the ward staff to report to her or to send samples from patients with suspected infections
    4. Infection control nurse helps in identifying cross infections and out breaks.
    5. Daily visit to all wards and units by the Infection control nurse to examine all records of clinical infections
    6. Nosocomial infection rates includes SSI rate with special reference to SSI rates for inguinal herniorraphy with mesh, Caesarean section, laproscopic cholecystectomy and coronary artery bypass grafting, IV catheter infection rates per 1000 catheter days, VAP rate per 1000 ventilator days, UTI for 1000 catheter days.

5.5 INFECTION SURVEILLANCE PROGRAMME FOR HAI

5.5.1 HIGH RISK AREAS IN THE HOSPITAL

Following are the identified high risk areas of hospital

⇒ ICU[SICU , MICU , NICU , PICU,CCU]
⇒ OT [All OTs]
⇒ Dialysis

- ⇒ Laboratory and Blood Bank
- ⇒ CSSD
- ⇒ Labour Room
- ⇒ Emergency
- ⇒ Waste storage Room
- ⇒ Endoscopy
- ⇒ Post operative ward
- ⇒ Cath Lab

5.5.2 METHOD OF SURVEILLANCE IN HIGH RISK AREAS

Area	Frequency of visit	Surveillance
ICU/POW	Daily	1. Sending Bi monthly culture swabs in case ICU/POW 2. Ensure one time cleaning of electronic surfaces with 1% Nusept and twice cleaning of all other horizontal surfaces as well as the floor with 1% bleach. 3. Check waste segregation. 4. Check compliance to hand washing 5. Check compliance to sterile techniques for procedures 6. Check change of IV cannula and IV set 7. Linen management – infection control practices 8. Survey on HAI – corrective action, to collect the device days and fill the daily surveillance forms. 9. Fogging of the cubicle is planned after the patient is discharged /shifted out from that

		particular cubicle.
Dialysis	Daily	1. Sending monthly culture swabs 2. Ensure one time cleaning of electronic surfaces with 1% Nusept and all other horizontal surfaces as well as the floor with 1% bleach. 3. Ensure monthly surveillance of RO plant water. 4. Check waste segregation 5. Check compliance to hand washing 6. Check compliance to sterile techniques for procedures 7. Linen management – infection control practices 8. Scrubbing and cleaning weekly on Sundays.
Operating room	Weekly	1. To ensure Sending weekly surveillance swabs 2. Maintaining proper ventilation [25(General OT)-30(super speciality OT) AC/H], humidity (40-60%) & temperature(20°C-22°C). 3. Check waste segregation 4. Adherence to cleaning protocol. 5. Linen management – infection control practices 6. Documentation related to flash sterilization. . 7. Fogging log book.
CSSD	Bi monthly	1. Check expiry dates on sterile sets 2. Check records on biological indicator 3. To ensure Sending weekly surveillance swabs 4. Check waste segregation 5. Adherence to cleaning protocol 6. Fogging log book 7. Sterilization documentation.

Labour room	Bimonthly	1. Ensure cleaning with 1% bleach after each delivery. 2. Check waste segregation 3. Check compliance to hand washing 4. Check compliance to sterile techniques for procedures 5. Linen management – infection control practices 6. Monthly surveillance swabs. 7. Adherence to cleaning protocol. 8. Fogging log book. 9. Check expiry dates on sterile sets.
Laboratory/Blood bank	Daily	1. Check waste segregation 2. Check PPE and sterile techniques 3. Ensure safe waste disposal 4. Adherence to cleaning protocol 5. Sending monthly surveillance swabs.
Emergency	Daily	1. Sending monthly surveillance swabs. 2.Check waste segregation 3.Check compliance to hand washing 4. Check compliance to sterile techniques for procedures 5. Linen management – infection control practices 6. Adherence to cleaning protocol. 7. Check expiry dates on sterile sets 8. Monthly once scrubbing and cleaning on Sundays.
Minor OT in	Bi Monthly	• To ensure Sending bi monthly surveillance swabs

Emergency		• Bi Monthly once scrubbing, cleaning and fogging
Waste storage room	Monthly	1. Check waste disposal. 2. Check records of waste collection. 3. Check disposal technique. 4. Cleanliness of waste storage area.

*culture swabs for GPB, GPC, GNB and Fungi

5.5.3 Other Periodical tests

Test done on	Tested for	Frequency
Potability of water	Biochemistry-level of chlorine Microbiology for Coliform bacilli	Once a month
Air sampling form OT	Any GPC, GNB. or Fungi	Once in 3 month
Air sampling form ICU	Any GPC, GNB. or Fungi	Once in 3 months
Food handlers	Hand swabs Stool for salmonella and Stool routine for ova & cyst. Nail Bed swabs for culture Nasal swab for Staphylococcus	Randomly Biannually Randomly

5.5.4 Blood Bank

Stored Blood component bags are processed for blood cultures –once a month.

5.5.5 Special studies

They are conducted if needed. This may include,

The investigation of clusters of infections above expected levels.

. The investigation of single cases of unusual or epidemiologically significant nosocomial infection.

. Incidence rates, collection of routine or special data as needed and sampling of personnel or the environment as needed.

Under Standard precautions, all patients receiving care in hospitals, irrespective of their diagnoses or presumed infections statuses, should be treated in such a manner as to reduce the risk of transmission of micro-organisms from health care worker to patient, patient to healthcare worker.

Cardinal rules of standard precautions

- Consider all **patients** potentially infectious
- Assume all **blood and body fluids and tissue** covered by standard precautions are contaminated with a blood borne pathogen.
- Assume all non- sterile needles and other **sharps** are similarly contaminated.

Purpose

To establish individual responsibilities in order to minimize the transmission of infection to, from, and between patients and all other people in facilities. The aim is to reduce the risk of transmission of micro-organisms from both known and unknown sources of infection in the hospital.

Definition

The measures designed to reduce the risk of transmission of blood borne pathogens and other micro-organisms from both recognized and unrecognized sources of infection.

POLICIES:

Standard precautions are to be used for all patients, to minimize risk to staff and patients.

Standard precautions are to be used for contact with:

Blood, body fluids, secretion and excretions regardless of whether or not they contain visible blood.

Non-intact skin

Mucous membrane.

Body fluids which may contain blood borne viruses (e.g. Hepatitis B, Hepatitis C, and HIV include: blood, blood-stained body fluids, CSF, semen, tissues ,vaginal secretions, pericardial, amniotic, peritoneal and pleural fluids.

Body fluids which may contain other pathogens include,

i. Faeces, urine.

ii. Vomitus, sputum.

6.4 PROCEDURE FOR STANDARD INFECTION CONTROL PRECAUTIONS

6.4.1 Hand washing

Hand washing is the single most important measure in infection control. Hand washing should be done:

- Before and after patient contact.
- After using gloves if there is any visible blood stain, secretion etc.
- Immediately after contact with blood, body fluids, secretions, excretions, non
- Intact skin or mucous membranes, and contaminated equipment.
- Always wash hands before leaving the ward.
- Before handling food.
- When the hands move from the contaminated body site to a clean body site during patient care.

6.4.2 Masks

- No need to be routinely worn.
- Any time the healthcare worker anticipates the possibility of being splashed with blood, body fluids, secretions or excretions.

Protective Eye wear and/or Face Shields

Any time the health care worker anticipates the possibility of being splashed blood, body fluids, secretions or excretions.

Gloves (clean, non-sterile)

ı. Wear for contact with blood, body fluids, secretions, excretions, mucous membranes, non-intact skin or surfaces soiled with visible blood or body fluids and contaminated equipment and articles.

ıı. Gloves should be changed between patients.

ııı. Change glove if a hand moves from contaminated body site to clean body site.

6.6.5 Plastic Aprons/Gown, caps, shoe covers, boots

i. For contact with infective material. To protect against transmission of highly transmissible organisms e.g. MRSA.

ii. Any time that clothing is likely to be soiled by splattering of blood, body fluids, secretion and excretions.

6.6.6 Handling Needles and Small Sharp

- Do not recap needles
- Dispose of used needles and small sharps in puncture-resistant container, which are located as close as possible to the area of use.
- Needles should not be recapped, bent or broken by hand.
- If a needle has to be removed from a syringe, use forceps or do it with utmost care.
- Do not overfill a sharps container. All sharps containers to be discarded when 3/4^{ths} full.
- Sharps should not be passed from one HCW (Health Care Worker) to another. The person using the equipment should discard it. If necessary a tray can be used to transport sharps.

Cleaning Blood & Body fluid Spills

TYPE OF SPILL	CLEANING RECOMMENDATIONS
• **SPOT CLEANING**	Put 2% sodium hypochlorite solution leave for 5 minutes clean with tissue paper. Discard contaminated materials. • Wash hands

SMALL SPILLS **(**Up to 10cms)	Collect cleaning materials and equipment. Wear disposable cleaning gloves. Wipe up spill immediately with absorbent material (e.g. paper hand towel). Place contaminated absorbent material into plastic bag for disposal. Cover the area with 2 percent sodium hypochlorite solution and leave the area for 5 minutes. Clean the area with warm water and detergent using a disposal cleaning cloth or sponge. And allow drying. Discard contaminated materials (absorbent towelling, cleaning cloths, disposable gloves and plastic apron) Wash hands
	• Collect cleaning materials and equipment. • Wear disposable cleaning gloves, eye wear and plastic apron should be worn if there is a likelihood of splashing occurring. • Cover area of the spill with paper towel, blotting paper, newspaper. • Cover area of the spill with 2 % sodium hypochlorite

• **LARGE SPILLS (> than 10cm diameter)**	and leave it for 5 minutes • Discard contaminated materials (absorbent towelling, cleaning cloths, disposable gloves and plastic apron) in infectious waste bag which should be incinerated. • Wipe area with absorbent paper towelling to remove any remaining blood. Wash hands • Use clinic cleaning materials to mop area with warm water and detergent. Clean and disinfect bucket and mop, dry and store appropriately • Wash hands

MERCURY SPILL MANAGEMENT

PROCEDURE

Note: Treat everything used during the clean-up procedure as 'hazardous waste.

Evacuate the spill area: before people leave the spill area, make sure they had not come into contact with mercury.

Secure the scene (use barrier tape if necessary) and restrict admission to only those persons cleaning up the spill.

Personal protective equipment: put on cap, face shield with mask, rubber gloves, plastic apron, and shoe cover.

Contain the spill: surround or block off the mercury to keep it from spreading onto sloped or porous surfaces. Divert all mercury away from floor drains, cracks, or crevices that may impact groundwater, surface water, and soils. If powdered sulfur or amalgamating agent is available, use it to contain the spill. Place barriers or tape around the site to prevent traffic through it.

Turn off ventilating or air conditioning systems. If feasible, turn off heating, ventilation or air conditioning systems for the parts of the building affected by the spill and seal the ventilation openings (both vents and returns).

Open windows and exhaust room air to the outdoors place a fan in an exterior room window blowing air outside.

Obtain a mercury spill kit

Pick up all visible mercury droplets

Never use a broom on a mercury spill

Check carefully for missed mercury: by using high intensity torch light.

Sprinkle fine powder sulfur or zinc on the spill site to bind any remaining mercury.

Next, gently transfer mercury into an unbreakable plastic container with a locking or air tight lid. If necessary, suction off the droplets using an eye dropper or syringe.

Place the mercury waste container(s) into a zip-top plastic bag.

Label the package “elemental mercury waste, [hazardous],” and store in a secure place.

Remove and dispose of contaminated articles that have directly contacted mercury. Double wrap these remnants in black bags and contact biomedical department for proper disposal.

Wash hands exposed to mercury using a soap and water.

Continue ventilation to completely air out the spill zone with outside air for a minimum of two days, preferably longer.

Produce an inventory of all remaining mercury-containing devices and replace them with mercury free alternatives.

6.6.10 Respiratory Hygiene/cough etiquette

This strategy is targeted at patients and accompanying members with undiagnosed transmissible respiratory infections and applies to any person with signs of illness including cough, congestion, rhinorrhoea or increased production of respiratory secretions when entering health care facility.

The elements of Respiratory Hygiene/cough etiquette includes:

6.6.10.1Education of healthcare facility staff, patients & visitors

6.6.10.2Posted signs at the entrance of the room.

Using surgical masks in coughing person when tolerated or cover the mouth & nose during coughing /sneezing.

Hand hygiene after contact with respiratory secretions.

Spatial separation, ideally more than 3 feet, of persons with respiratory infections in common waiting areas.

6.6.11. Safe Injection Practices

6.6.11.1Use of single-use sterile, disposal needle & syringe for each injection given.

6.6.11.2Single dose vial preferred over multi dose vials

Use fluid infusion & administration sets (IV bags, tubing's & connectors) for single patient only.

Infection control practices for special lumbar puncture & placement of central venous catheter – face masks are effective in limiting dispersal of oropharyngeal droplets.

6.6.8 Recommendations for Patients Known To Harbor Blood Borne Pathogens

6.6.5.1 Instructions for wards

6.6.5.1.1 Admission

- Patients with HIV disease but presenting with unrelated illnesses may be admitted in any ward.
- Patients with AIDS requiring isolation on account of secondary infectious disease will be isolated as per the isolation policies and procedures.

Preparation of the patients

It is the responsibility of the attending physician to ensure that patients, testing positive are informed about the result and receive counselling. The results of the HIV test must be kept strictly confidential.

Yellow bag

- The ward sister must ensure that when a patient with HIV, HBV or HCV infection is admitted, all contaminated reusable items that are autoclavable are placed in yellow autoclavable bag tied and sent to decontamination room for decontamination.

- Following decontamination they are reprocessed in the CSSD.
- Heat sensitive items
- After autoclaving, yellow bag back brought back to the ward, opened, content sorted and sent to CSSD for sterilization along with other items.

6.6.5.1.1.4 Specimens

- Adequate precautions are to be taken while collecting specimens.
- The specimens are to be transported in leak-proof containers.
- Ensure that the cover and the outside of the container are not contaminated.

6.6.5.1.1.5 Waste disposal

- A bin lined by a yellow plastic bag is placed in the patient's room for infectious waste.
- When the bag is 3/4th full it is sent for incineration.
- Non-infectious waste does not require special precautions and is disposed in a manner similar to non-infectious waste generated from any other patient.
- Sharps are discarded into the sharps container.

6.6.5.1.1.6 Death of a patient

- Nursing staff must inform the Medical Director as well as the infection control nurse before sending the body to the mortuary.
- Those cleaning and packing the body should use gloves and other protective gear. Before leaving the ward, the body is bagged and terminal cleaning and disinfection procedure is carried out.

HAND HYGIENE & OTHER TECHNIQUES

Indications for Hand washing & Hand Antisepsis

When hands are visibly dirty or contaminated with proteinaceous material or are visibly soiled with blood or other body fluids, wash hands with either a non-antimicrobial soap and water or an antimicrobial soap and water.

If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands.

Decontaminate hands before having direct contact with patients.

Decontaminate hands before donning sterile gloves when inserting a central intravascular catheter.

Decontaminate hands before inserting indwelling urinary catheters, peripheral vascular catheters, or other invasive devices that do not require a surgical procedure

Decontaminate hands after contact with a patient's intact skin (e.g., when taking pulse or blood pressure, and lifting a patient.)

Decontaminate hands after contact with body fluids or excretions, mucous membranes, non-intact skin, and wound dressings if hands are not visibly soiled.

Decontaminate hands if moving from a contaminated body site to a clean body site during patient care.

Decontaminate hands after removing gloves.

Decontaminate hands after contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient.

Before eating and after using rest room, wash hands with an antimicrobial or non-antimicrobial soap and water.

Wash hands with soap and water if exposure to Bacillus anthracis is suspected or proven as alcohols, iodophors, chlorhexidine are not effective against spores.

Decontaminate hands between patients.

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WHO SLOGAN

1. Clean care is safer care

2. Save lives Clean your Hands

Hand Hygiene Technique

When decontaminating hands with an alcohol based hand rub, apply product (3ml) to palm of one hand and rub hands together, covering all surfaces of hands and fingers until hands are dry.

When washing hands with soap and water, wet hands first with water, apply soap (liquid) and rub hands together vigorously for at least 30 seconds, covering all surfaces of hands and fingers. Rinse hands with water and dry thoroughly with a disposable towel Use tissue to turn off the faucet. Avoid using hot water, as repeated exposure to hot water may increase the risk of dermatitis.

Soap bars are acceptable when washing hands with non-antimicrobial soap and water. Use soap racks that facilitate drainage and small bars should be used.

Multiple use cloth hand towels are not recommended for use in hospitals, Disposable paper towels can be used for hand drying.

Other Aspects of Hand Hygiene

Do not wear artificial fingernails, bangles or rings when having direct contact with patients at high risk. Keep natural nail tips less than ¼ inches long.

Wear gloves when contact with blood or other potentially infectious materials, mucous membranes, and non-intact skin could occur.

Remove gloves after caring for a patient. Do not wear the same pair of gloves for the care of more than one patient, and do not wash gloves between uses with different patients.

Change gloves during patient care if moving from a contaminated body site to a clean body site.

Golden Rules

30 second Hand hygiene before entering ICU and in between patient care.

Roll sleeves above elbows and remove rings, watch & jewellery.

Surgical Hand Antisepsis

Remove rings, watches and bracelets before beginning the surgical hand scrub.

Remove debris from underneath fingernails using a nail cleaner under running water.

When performing surgical hand antisepsis use 7.5% Povidine iodine scrub, scrub hands and forearms for 1 minute.

Monitoring Of Hand Hygiene Practices

Compliance with proper hand hygiene is monitored regularly.

CLINICAL HANDWASH	
When	• Healthcare workers should wash hands with soap and water when hands are visibly dirty, contaminated or soiled. • Use an alcohol-based hand rub when hands are not visibly soiled to reduce bacterial counts.

Why	To remove transient organisms and reduce resident flora.
How	**If Using Soap:** □ Wet hands first with water □ Apply the amount of soap recommended by the manufacturer □ Rub hands together for at least 30 seconds, covering all surfaces of the hands and fingers □ Rinse hands with water □ Dry thoroughly with a disposable towel □ Use the towel to turn off the faucet. **If Using Alcohol Rub:** □ Hands should be free of dirt and organic material. □ The hand rub solution must come into contact with all surfaces of the hand. □ The hands must be *rubbed* together vigorously, following the 6/7 steps of hand washing for 30 seconds paying particular attention to the tips of the fingers, and until the solution has evaporated and the hands are dry.

SURGICAL HANDWASH

When	Prior to surgery or invasive procedure
Why	To reduce resident flora and to remove or destroy transient organisms
How	Surgical hand hygiene (or antisepsis) can be performed by using either an antiseptic soap OR an alcohol-based hand rubs with persistent activity. When an antiseptic soap is used, the hands and forearms should be scrubbed for the length of time recommended by the product's manufacturer, usually 3-6 minutes. • When an alcohol-based hand rub with persistent activity is used, follow the

	Manufacturer's instructions on the amount of product to use. Pre-wash hands and forearms with a non-antimicrobial soap and allow them to dry completely. After application of the alcohol-based product as recommended, allow hands and forearms to dry thoroughly before donning sterile gloves.

Hand washing techniques

Wet both hands before application of soap (liquid is preferable). Follow the technique below for 15 – 30 seconds ensuring that each step consists of at least three strokes backwards and forwards.

Step 1
Rub palm to palm

Step 2
Right palm over back of left hand and left palm over back of right hand

Step 3
Palm to palm, with bent and spread out fingers

Step 4
Backs of fingers to opposing palms with fingers interlocked

Step 5
Circular rubbing of left thumb in closed right hand and vice versa

Step 6
Circular rubbing, backwards and forwards with closed right hand fingertips in left palm and vice versa.

Finally, rinse and dry hands thoroughly

Special attention should be paid to fingertips, thumbs and other areas of hands likely to contact a contaminated site. Hands should be rinsed in clean water. Care should be taken to dry the skin with paper towels to avoid skin damage. If frequent washing has been performed hand cream should be applied at the end of duties to prevent skin desiccation and cracking.

6.8 Technique of Gloving

There are two categories of gloves available in the hospital:

Examination gloves: These gloves are clean but not sterile. They are used for all procedures that do not require sterile technique.

Sterile gloves: These are used for all procedures where sterile technique is mandatory. Each pair of gloves is supplied in sealed covers.

.Procedure for wearing gloves

Pairs of sterile gloves are packed in such a way as to facilitate handling without touching the outside of the gloves with bare hands. A 2'' cuff is folded on each glove

The packet containing the gloves is first peeled open.

Pick up the powder packet from the right hand glove and powder both hands away from the sterile field. This is to avoid risk of accidental spilling of powder over sterile gloves.

'Open' Method:

Pick up the first glove by gripping its cuff with one hand and slip the other hand in.

With the gloved hand, pick up second glove by slipping hand under the cuff (outside of the glove) and slip the ungloved hand in and release the grip.

At this stage adjust the fingers of the gloves properly.

If gowned, the cuff of the second glove is pulled over the stockinette sleeve of the gown.

The cuff of other glove is then pulled over the stockinette sleeve.

'Closed' Method:

The hands are not pushed beyond the stockinette cuffs of the gown.

The cuff of the left hand glove is grasped through the stockinette part of the right sleeve.

The left hand is inserted into the glove and the glove grasped by the right hand is pulled over the left hand.

After stretching the cuff, the glove is pulled over the sleeve, and the hand is forced through the stockinette cuff into the glove.

The second glove is put on in a similar manner except that the cuff can be grasped with the already gloved hand and the right hand is forced through the stockinette cuff into the glove. Glove powder can cause irritation and induce postoperative adhesions between intestinal loops and the wound. Hence, it should be wiped off with a sterile wet mop.

There is no strict protocol for wearing unsterile (examination) gloves.

Removal of Gloves (for both types of gloves):

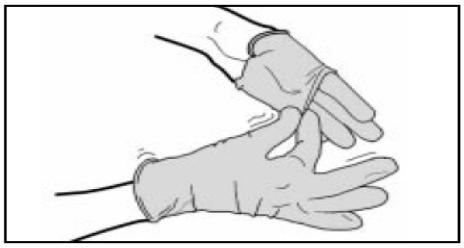
To prevent outer surface of gloves from contaminating hands, the gloved fingers of one hand grip the outer surface of the cuff and pull off the glove inside out.

To prevent contamination of the ungloved hand, the inside of the cuff of the opposite glove is held and pulled off the hand.

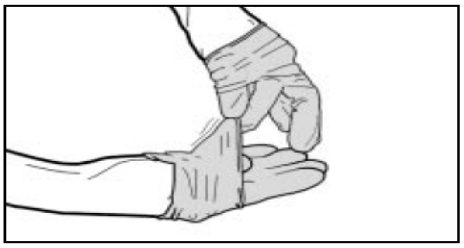
Gloves are discarded into the designated container.

Removal of Gloves Technique

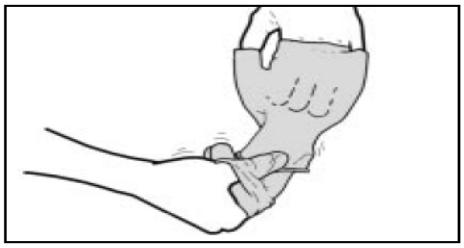
1. Use the following pictures as a guide to help you remove gloves safely
2. Avoid touching the outside of the gloves. Only touch the inside
3. Wash hands after removing and disposing of gloves in a sealable bag



1. Grasp one glove at wrist and pull down to knuckles

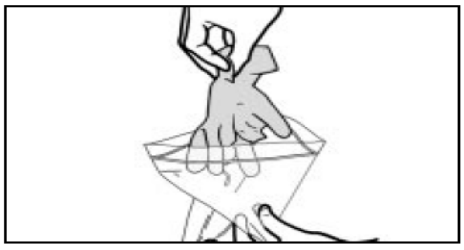


2. Grasp other glove at wrist and pull down to knuckles



3. Grasp wrist end of one glove and pull it off completely

4. Remove other glove in a similar way, touching only the inside of gloves



5. Dispose of gloves in a sealable plastic bag

6. Wash hands after removing and disposing of gloves

Photocopy, place in plastic sleeve (or laminate) and position on the wall in first aid areas.

6.9 Use of Masks

The traditional masks of four to six layers of muslin offers very limited protection. When first worn it may be reasonably efficient, but soon becomes saturated with moist vapour from the wearer's breath.

More efficient masks are of high filtration disposable type several brands are available, any may be used. These masks can be moulded to facial contours and actually filter the respiration as compared to deflection with paper or cellophane insert masks.

Such masks achieve 98 percent efficient filtration compared with only 40 percent with muslin mask.

Masks should be changed once every 4 hours.

Procedure for using a mask.

When wearing the mask, care should be taken to see that the nose, mouth and facial hair are well covered.

Mask should be changed at least every operating session and should never be worn "around the neck".

Mask 'wiggling' is also a potential source of infection.

When removing a mask, care should be taken to avoid touching the part which has acted as the filter. The hands can easily become contaminated with bacteria.

6.10 Use of Gowns

Gowns are available as different types

Isolation gowns: These gowns are clean but not sterile. They are used while handling patients who require isolation. These prevent transmission of infection from the patient to the health care worker.

Surgical gowns: They are sterile gowns that are used for aseptic procedures.

Plastic aprons: They are used whenever spills are expected. They prevent fluids from soaking the clothes of the health care worker.

Gowning Technique (For sterile gowns)

Sterile gowns are always folded inside out to avoid contamination. As it is impossible to render the hands sterile, they must not come in contact with the outside of the gown or gloves.

Procedure:

- Hands must be washed thoroughly.
- Pick up the gown holding it well away from the trolley and your own body.
- Hold the neck band and unroll until the sleeves are seen.
- Slide both hands and arms into the sleeves at the same time.
- The floor nurse / assistant slides her hands under the gown at the shoulder and pulls out and fastens all the back tapes.
- Cover the back with the back flap with the help of the scrub nurse.

Remember:

- Do not keep the hands lower than the waist line.

- Do not keep the hands near ones neck or shoulder.
- Do not touch the axillary area once gowned.
- Do not touch the back of the gown.

Removal of Gown at the end of the Procedure

- The circulating nurse will unfasten the gown.
- The gown is carefully removed by the scrub nurse leaving the gloves on.
- The gown with the inside folded out is placed in the appropriate bin.
- The gloves are then removed by holding the inside of the cuff and placed in appropriate container.

6.11 APPROPRIATE BARRIER PRECAUTIONS FOR DIFFERENT PROCEDURES

PROCEDURES	GLOVES	GOWNS	MASKS	EYE PROTECTION
Venipuncture	Yes	--	--	--
Cannulation	Yes	--	--	--
Arterial cannulation	Yes	Yes	Yes	--
Urinary catheterization	Yes	--	--	--
Broken skin of HCW	Yes	--	--	--
Nursing of compromised patients	Yes	Yes	Yes	--

Ryle's tube insertion	Yes	--	--	--
Sputum induction	Yes	--	Yes	Yes
General Nursing	--	--	--	--
Tracheostomy Suctioning	Yes	If required	Yes	Yes
Open Suctioning	Yes	If required	Yes	Yes
Postsurgery physiotherapy [Orthopaedics]	Yes	--	--	--
Cleaning Equipment	Yes	--	Yes [If required]	--
Blood sampling	Yes	--	--	--
ICU/OT cleaning	Yes	--	Yes [If required]	--
Vaginal delivery	Yes	Yes	Yes	--
Specimen & sample Handling	Yes	--	--	--
Dental procedure	Yes	--	--	--
General cleaning of the unit	Yes	--	--	--

7 ISOLATION POLICIES & PROCEDURES

INTRODUCTION

Isolation practices are meant to prevent transmission of pathogenic micro-organisms within the hospital.

AIM:

To prevent the transmission of pathogenic micro-organisms within the hospital.

To recognize the importance of all body fluids, secretions and excretions in the transmission of nosocomial pathogens.

To practice adequate precautions for infections transmitted by airborne, droplet & contact.

Measures for reduction of transmission.

FUNDAMENTALS OF ISOLATION PRECAUTIONS

Use standard precautions for the care of all patients

Hand Hygiene

Wash / decontaminate hands with alcoholic hand rub, as promptly and thoroughly as possible between patient contact and after contact with blood, body fluids, secretions, excretions, and equipment or articles whether or not gloves are worn. Wash hands after gloves are removed and also between tasks and procedures on the same patient to avoid cross-contamination of different body sites.

Gloves:

7.3.1.2.1 Gloves are worn to provide a protective barrier to prevent gross contamination of hands when touching blood, body fluids, secretions, excretions, mucous membranes, and non-

intact skin, and to reduce the likelihood that micro-organisms present on the hands of HCW will be transmitted to patients during patient-care procedures.

Wearing gloves does not replace the need for hand washing. Failure to change gloves between patient contacts is an infection control hazard.

Clean, unsterile gloves may be worn as a protective barrier during procedures such as turning the patient in bed.

Sterile gloves are worn when sterile procedures are undertaken

Personal Protective Equipment: (PPE)

Gowns: A clean, non sterile, gown is worn to prevent contamination of clothing and skin of personnel from exposure to blood and body fluids. When gowns are worn to attend to a patient requiring barrier nursing, they are removed **before leaving the patients environment and hand washing is done**.

Masks and goggles: This equipment is worn to provide barrier protection.

Mask should cover both the nose and the mouth.

7.4 PATIENT ISOLATION:

Patients are isolated when suffering from highly transmissible diseases e.g. chicken pox. Pulmonary tuberculosis, cholera. Patient is placed in a single room with hand washing and toilet facilities.

7.4.1 Barrier Nursing

Barrier nursing: The aim is to erect a barrier to the passage of infectious pathogenic organisms between the contagious patient and other patients and staff in the hospital.

Preferably, all contagious patients are isolated in separate rooms, but when such patients must be nursed in a ward with others, screens are placed around the bed or beds they occupy.

7.4.2.1 **Cohort nursing:** May be practiced as re-infection with the same organism is unlikely.

7.4.2.32Nurses, attending consultants and also any visitors must wear gowns, masks, and sometimes rubber gloves and they observe strict rules that minimize the risk of passing on infectious agents. Hand hygiene practices are observed after they have been attending the patient.

7.4.2.1 Bedding is carefully moved in order to minimize the transmission of airborne particles, such as dust or droplets that could carry contagious material.

Barrier nursing must be continued until subsequent cultures give a negative report.

7.4.3 Cleaning of equipment and articles

Contaminated disposable articles are bagged appropriately in leak proof bags and disposed.

Critical reusable medical equipment is sterilized after use.

Non-critical equipment is cleaned, disinfected after use.

Laundry

Soiled linen should be handled as little as possible and with minimum agitation to prevent gross microbial contamination of the air and of persons handling the linen. All soiled linen should be bagged in yellow cover and sent to the laundry as infectious to be treated separately.

Eating Utensils

Routine cleaning with detergent and hot water is sufficient.

7.4.7 Terminal Cleaning

Terminal cleaning of walls, blinds, and curtains may be done followed by fogging and documented.

ISOLATION POLICY FOR CERTAIN GROUPS OF ORGANISMS

MRSA:

When MRSA is isolated from clinical samples, floor in charge nurse shall inform the infection control nurse / officer regarding the same for initiation of isolation precautions .

Patient is isolated and barrier nursed.

Hand washing is strictly adhered to by all concerned.

Linen is changed on a daily basis. Any contamination of linen requires be bagging into yellow cover, labeling accordingly, and tying before sending to the laundry.

Carbapenamase producing gram negative bacteria :

The aim is to curtail the spread of such bacteria. Hence patient is to be placed on strict barrier nursing precautions irrespective of whether the organism is a coloniser or the cause of infection.

Pulmonary tuberculosis:

N 95 Masks should be used both for the patient as well as by the health care workers during the care of all patients with sputum positive pulmonary tuberculosis.

* **Note: Isolation precautions are to be followed until all previous culture sites are negative as per the SOPs.**

7.5.4 HIV/HBsAg/ HCV infected patients: Standard precautions.

Infection control measures for MRSA and VRE or Multi drug resistant harbouring patients :

Isolate any patients in single room.

Investigate any outbreak: Other patients, Staff.

Educate staff on hand washing, caring skin lesions, and antibiotic use.

Screen hospital transfer patients, where the hospital of transfer carries a risk of MRSA infection.

Administrative Considerations

7.6.5.1 Patients need to be screened:

7.6.5.1.1 Patients transferred from other hospitals or Nursing home. (Duration of stay > 48HRS) with any of the following.

- Patients with open/discharging wounds.
- Patient with ventilator.
- Patients with central line / Foleys catheter or infected peripheral line.
- Patients with multiple i/v antibiotics.
- Patient with TPN/RT feed

7.6.5.1.2 Staff

- Screening carried out on staff with infective dermatitis or other exfoliates skin conditions.
- Nasal swabs – need only be carried out in the event of an outbreak.

Procedure for screening patients in the "at risk" group

- Culture swab to be taken from Nose, axilla, and sent to lab.
- Culture swab taken from any potentially infected lesion such as a wound, a chronic ulcer or area of diseased skin.

Isolation of patients infected with MRSA/ VRE or Multi drug resistant cases

All waste to be treated as "contaminated" and placed in yellow bag.

.Gloves and aprons must be worn for changing the beds of incontinent patients, attending dirty wounds, changing and cleaning suction bottles.

Masks to be worn when doing all the procedures.

Plastic aprons worn when attending patient.

Soiled, contaminated infectious linen to be placed directly into the yellow plastic bag and sealed, autoclaved and then sent to laundry.

7.7 POLICY: ISOLATION OF INFECTIOUS PATIENTS WITH SPECIAL REFERENCE TO MRSA /VRE

Standard Isolation

Single room [Room No 324 in the third floor semiprivate wing has been identified as the isolation room for non-critical patient]

The room door is keep closed.

Hand washing

This is the most important measure to prevent the spread of infection. Hands must be washed and dried thoroughly after attending to the patient's care procedure, after removing the plastic apron and before leaving the room. Any abrasions should be covered with waterproof plasters.

Disposable Plastic Aprons

To be used when required.

Disposable Gloves

Non-sterile latex gloves must be worn for direct contact, helping with personal care and handling contaminated materials. After use place directly into clinical waste bag kept in the room. Then wash hands thoroughly before leaving the room.

Linen

It is essential that bed making should be done in such a manner that bacteria are not distributed around the room. Soiled linen must be placed into yellow bags whilst in the room, taking care not to contaminate the outside label then taken directly to the laundry.

Equipment

Once this has been taken into the room it should remain there until the patient has recovered. It is necessary to decontaminate the equipment for use elsewhere.

Charts

The patient charts/notes must be kept outside the room.

Laboratory Specimens

They should be placed in zip-lock bags with biohazard labels as per the hospital policy and transported to the laboratory.

Faeces/Urine

Where possible allow patients to use their own toilet facilities. Normal daily cleaning is sufficient if the patient is continent. Gloves and aprons must be worn when handling urinals and

Bedpans indented for the patient use. If a commode is used this must be kept for the patients sole use within their rooms. Wear gloves and apron when emptying and cleaning.

Clinical Waste

All disposable items should be discarded as per the hospital policy, sealed and labeled before final disposal.

Transfers

In the event of a transfer within hospital notify the ward in advance and inform the infection control nurse in order to ensure precautions to be taken.

Limit transport to diagnostic & therapeutic procedures that cannot be performed in patients' room.

Labels: Patient's chart and bed is to be labeled –"contact isolation" at the bedside until the patient is cleared of the infection.

Terminal disinfection of the room: The room and all surfaces should be cleaned with a disinfectant solution so that the environment is cleared of Staphylococci. 10% Bacci shield is recommended for the same.

Visiting

Restrict visitors. Keep staff contact to a minimum.

Decolonization of MRSA Carriers

- Colonization may be transient or may persist for weeks, or months.
- For nasal carriage 1 % chlorhexidine paste TID for 15 days or Mupirocin in a paraffin based TID for 5 days can be used, For skin carriage 4 % Chlorhexidine (Microsheild 4) daily bath for 1 week.

- For MRSA clearance patients are screened weekly and three negative screening indicate clearance.

7.7.1.16 Treatment of cases

- The drug of choice for treatment of severe systemic MRSA infections is intravenous Vancomycin.
- If an MRSA colonized patient has to undergo a surgical procedure, then it is recommended that antibiotic prophylaxis, with Vancomycin (1 – 2 doses) should be used.

Cleaning Guidelines

- Routine cleaning of accommodation is required.
- Standard cleaning agents can be used for cleaning tables and floors.
- Porous surfaces, benches, floors, surfaces contaminated by secretions and walls likely to be contaminated should be cleaned with 1% Sodium hypochlorite.

7.8 DRAINAGE SECRETION PRECAUTIONS:

For patients with infections where organisms are present in wounds or wound drainage, infectious material should be sent for autoclaving after the patient is discharged, mattresses and pillows need to be disinfected by wiping with soap and water, followed by 1% Sodium hypochlorite.

7.8.1 Diseases requiring drainage secretion precautions:

- Abscess
- Decubitus ulcer
- Skin or wound infection
- Conjunctivitis

- Masks are not indicated, unless splash is likely
- Gowns are indicated if soiling is likely
- Gloves are indicated for touching infected material
- Hands must be washed after touching the patient or potentially contaminated articles and before taking care of another patient
- Articles contaminated with infective material must be discarded or bagged and labeled before being sent for decontamination and reprocessing.

7.9 POLICY FOR PATIENTS WITH SMEAR POSITIVE PULMONARY TUBERCULOSIS

Note: Ascertain whether hospitalization is required.

Hospitalization is required

ICU not required

Keep the patient in the isolation room provided with the exhaust fan.

The AC air is not returned to the general system.

Provide filter mask to the patient.

Inform all the health care workers regarding the isolation.

Provide filter mask to all the visitors.

Do not permit the patient to move around the corridor.

Once stable discharge immediately.

Needs ICU care

Shift the patient with a filter mask to ICU isolation room.

If the patient is on ventilator nothing to worry as it is a closed system except while suctioning where strict air borne precautions using N-95 mask is to be followed.

Once extubated shift to isolation room.

Institute all airborne precautions.

7.10 VARICELLA ZOSTER [CHICKEN POX] POLICIES AND PRECAUTIONS

Shift the patient immediately to isolation room.

Keep designated immune staff (previous history of chicken pox or those who received two doses of the vaccine).

Immunize the exposed nurse if not immune.

Keep the door of the room closed all times.

Institute all air borne precautions and above given precautions till the scab dry.

7.11 MEASLES, POLICIES AND PRECAUTIONS:

Air borne precautions, should be initiated and maintained for all patients suspected of having measles. Persons with measles are contagious from 4 days prior to rash onset through 4 days after rash onset.

7.11.1 Policy for handling patients with suspected measles:

7.11.1.1 Patients suspected of having measles should be masked immediately. If a surgical mask cannot be worn, other methods of source containment should be used (e.g., entering through back or side door and immediately placed in examination room).

Suspect measles patients should be scheduled for appointments at the end of the day.

Suspect measles patients should not be allowed to wait in the common waiting area or other common areas. They should be isolated immediately in an airborne infection isolation room if one is available. If not available, the patient should be placed in a private room and the door should be closed.

Susceptible visitors should not be allowed in the patient room.

Healthcare personnel who should be allowed in the patient exam room are those with documentation of 2 doses of live measles vaccine or laboratory evidence of immunity (measles IgG positive).

Post-exposure prophylaxis

Vaccination with the measles/mumps/rubella (MMR) vaccine may prevent or modify disease if given within 72 hours of exposure. Immune globulin (IG) may prevent or modify disease if given within 6 days of exposure. Individuals at risk for severe disease and complications from measles, such as infants younger than 1 year of age, pregnant women without evidence of measles, and immunocompromised individuals should receive IG. IG should not be used to control measles outbreaks.

Vaccination

Vaccination with the MMR vaccine at the appropriate age is the best way to protect against measles. Healthcare workers should be immunized with 2 doses of MMR.

7.12 REVERSE ISOLATION CATEGORY

The purpose of reverse isolation category is to prevent infections in the immunocompromised patients. The principle is to prevent contact between pathogenic micro-organisms from HCWs or fomites and susceptible patients who have severely impaired resistance.

- Diseases that require reverse isolation are-
- Severe neutropenia
- Leukaemia and other malignancies
- Organ and tissue transplant patients
- Patients on immunosuppressive therapy
- Burns and extensive wounds susceptible to infection

7.13 TRANSMISSION-BASED PRECAUTIONS

Transmission-Based Precautions are used when the route(s) of transmission is (are) not completely interrupted using Standard Precautions alone. When Transmission-Based Precautions are indicated, efforts must be made to counteract possible adverse effects on patients. i.e., anxiety, depression and other mood disturbances, perceptions of stigma, reduced contact with clinical staff, and increases in preventable adverse events in order to improve acceptance by the patients and adherence by HCWs

7.13.1 There are three categories of Transmission-Based Precautions:

- Contact Precautions
- Droplet Precautions
- Airborne Precautions

7.13.1.1 Contact Precautions

- Contact Precautions are intended to prevent transmission of infectious agents, including epidemiologically important micro-organisms, which are spread by direct or indirect contact with the patient or the patient's environment.
- Contact Precautions also apply where the presence of excessive wound drainage, faecal incontinence, or other discharges from the body suggest an increased potential for extensive environmental contamination and risk of transmission.
- A single patient room is preferred for patients who require Contact Precautions. When a single-patient room is not available, consultation with infection control personnel is recommended to assess the various risks associated with other patient placement options (e.g., coherting, keeping the patient with an existing roommate).
- In multi-patient rooms, >3 feet spatial separation between beds is advised to reduce the opportunities for inadvertent sharing of items between the infected / colonized patient and other patients.
- Healthcare personnel caring for patients on Contact Precautions wear a gown and gloves for all interactions that may involve contact with the patient or potentially contaminated areas in the patient's environment.
- Donning PPE upon room entry and discarding before exiting the patient room is done to contain pathogens, especially those that have been implicated in transmission through environmental contamination.

7.13.1.2 Droplet Precautions

Droplet Precautions are intended to prevent transmission of pathogens spread through close respiratory or mucous membrane contact with respiratory secretions. Because these pathogens do

not remain infectious over long distances in a healthcare facility, special air handling and when a single-patient room is not available, consultation with infection control personnel is recommended to assess the various risks associated with other patient placement options (e.g., cohering, keeping the patient with an existing roommate).

- Spatial separation of > 3 feet and drawing the curtain between patient beds is especially important for patients in multi-bed rooms with infections transmitted by the droplet route.
- Healthcare personnel wear a mask (a respirator is not necessary) at all times or when within 3 ft space around the patient.
- Patients on Droplet Precautions who must be transported outside the room should wear a mask if tolerated and follow Respiratory Hygiene/Cough Etiquette.

7.12.1.3 Airborne Precautions

Airborne Precautions prevent transmission of infectious agents that remain infectious over long distances when suspended in the air (e.g., Rubeola virus [measles], Varicella virus [chickenpox], M. Tuberculosis, and possibly SARS-CoV).

- Negative pressure room preferred.
- Healthcare personnel caring for patients on airborne precautions wear N-95 mask or respirator, depending on the disease-specific recommendations, which are donned prior to room entry.
- Limit patient's movement, place the mask if patient is to be transported outside.

8 HOSPITAL Visitors Policy

Although instructing and preparing visitors for patients in isolation is time consuming and often frustrating. Their presence is valuable to the emotional wellbeing of the patient.

The ward sisters and the doctors concerned shall have the responsibility of informing the patients' relatives of the measures to be taken and the importance of restriction of visitors. This should be done at admission of the patient.

At the time of admission, the patient is given a brochure depicting the infection control precautions he/she as well as his/her care takers need to take during their hospital stay to prevent acquiring health care associated infections.

The patient and the relatives must be given health education about the cause, spread and prevention for the infection, in detail. The need for isolation and restriction of visitors should be discussed with them.

Hand washing after all contact with the patient will have to be stressed.

No more than two adult visitors should be allowed 'at a time' during the hospital visiting hours.

Visitors having visitors pass obtained from the hospital are allowed to visit the patients.

The visiting hour permitted in our hospital general wards is from 7 AM to 8 AM , Afternoon 1 PM to 2 PM and evening 4 PM to 5PM on all days .

Children below 12 years are not allowed into the isolation areas.

Before entering the room, visitors must enquire at the nurses' station for instructions and for gown and mask if indicated. Visitor's footwear, bags etc., should be left outside the room. Only articles that can be discarded, disinfected or sterilized should be taken into the room.

Visitors who have or had experienced fever, cough, cold, sore throat, vomiting should be discouraged from visiting the patients.

Visitors are not allowed to sit on the patient's bed.

Visitors should wash their hands well with soap and water before entering and when leaving the room.

Visitors must maintain a quiet environment and avoid unnecessary noise.

Visitors must maintain 'No Smoking' policy.

Active immunization of attendants and other follow up steps, where applicable must be advised by the physician in-charge.

Flowers, fruits, snacks, outside meals are strictly not allowed in the hospital.

9 Employee Health

HCWS such as medical and technical staff attenders and cleaners are at high risk of occupationally acquired infections because of their potential for coming into contact with pathogens or infected patients.

Prevention:

Safe working practices \ standard precautions

Immunization:

9.1.2.1 HBV Vaccine :

- All health care workers including the doctors are encouraged to have vaccination against Hepatitis B before they resume their duty in the hospital and for those who are already immunized are advised to check their anti-HBs titres.
- Booster dose is recommended for those with titres ≤ 10 MIU.
- Following the booster dose, titres are rechecked after 4 weeks following vaccination for rise in titres.
- In still there is no rise in titres, revaccination is recommended with 3 doses.

- Following revaccination, titres are repeated after 4 weeks and no action is taken if the titres are in the satisfactory range .But if the titres still remain ≤ 10 MIU, the health care worker is given a non-responder card and explained with the importance of combined vaccination in case there is occupational exposure to blood and body fluids by the Infection control officer.

9.2 Health services:

9.2.1 Placement evaluation:

When a person is appointed initially, a placement evaluation is done to ensure that person with specific health problems are not placed in jobs that would put them under a risk of infection and also confirm that vaccinations required are complete.

- Employee health and safety education: Induction programme shall be conducted as per the hospital schedule .Safety education starts at the time of employment–videos showing universal precautions should be screened and allowed to answer questionnaires. All staff are informed of the need to report exposure to blood or potentially infectious body fluids to the Infection control Officer or the CMO.
- Health check-up: To be conducted annually.

Immunization:

- HBV : All HCWs should receive 1 ml (20 mg) in the deltoid at 0,1,6 mth course. After one month after completion of the schedule the HCWs are screened for anti HBs levels .If anti HBs is > 10 IU\ml then they are responders and do not require any further testing and if <10 IU/ml ,then they are noon-responders and are tested for HBsAg seropositivity .If HBsAg negative then give one more course .Those not responding are considered permanently susceptible and require HBIG.

Exposure to blood borne pathogens: Refer Occupational exposure to blood and body fluids.

10 Hospital Antibiotic Policy

10.1 INTRODUCTION

Hospital Antibiotic Policy has been designed to treat common infections effectively and with the minimum risk of healthcare-associated infections. The current antibiotic policy describes the procedures to encourage the use of the Antibiotic Guidelines and to ensure that antibiotics are not prescribed in a way which is likely to lead to healthcare-associated infections.

10.1 OBJECTIVES

The aim of the ICC is to ensure that antibiotics are utilized across the hospital in a way which results in optimal treatment of infections with minimal risk of healthcare-associated infections.

The group's specific objectives are as follows:-

To improve patient care by considered use of antibiotics for prophylaxis and therapy.

To ensure an antibiotic is available to overcome infections caused by any pathogen. Higher antibiotic should therefore be kept in reserve.

To monitor changes in healthcare-associated infections in clinical areas across the hospital.

To formulate an annual action plan for determining how adherence to the Antibiotic policy can be increased.

To formulate an action plan for educating all relevant clinical staff on antibiotic prescribing.

To ensure that the Antibiotic policy is reviewed annually and kept up-to-date.

To plan for education on antibiotic prescribing to all relevant clinical staff.

10.2 PRESCRIPTION

Before prescribing please confirm your choice with the consultant or microbiologist.

Ensuring that antibiotic prescribing is appropriate will be achieved by three principal mechanisms:

- Education on appropriate prescribing
- Feedback of antibiotic prescribing data
- Restrictions on antibiotic usage

10.2.1 Education of staff on appropriate prescribing

The ICC will conduct prescription audit every six months to ensure that all relevant clinicians will prescribe the antibiotics as per the hospital antibiotic policy.

Audit will be based on :

No of antibiotics prescribed.

Dosage and durations of antibiotics mentioned in prescription.

Whether antibiotics prescribed correlate with culture and antibiotic sensitivity report.

Following audit , the findings shall be analyzed , and confidential report will be mailed to the concerned clinician on observation of any lapses after informing the Medical Director and shall be followed up for implementation of the same .

10.2.2 ANTIBIOTIC COMMITTEE

An antibiotic committee has been formulated under the chairmanship of Dr.Deviprasad Hegde, who is a physician cum Consultant Intensivist.

Functions of the committee:

The committee shall meet once in three months to discuss the following issues,

Prescription practices of consultants across the hospital.

To monitor adherence to hospital antibiotic policy by conducting prescription audits once in 6 months or retrospectively through the report generated by the Pharmacy in charge regarding no of prescriptions per month for particular antibiotics.

Regarding consideration for antibiotic cycling / rotation.

Devising empirical antibiotic therapy every 3 months for the hospital.

The Consultant Microbiologist in coordination with the Chairman, antibiotic committee shall renew the hospital antibiotic protocol annually.

10.2.2 Feedback of antibiotic prescribing data and healthcare-associated infection surveillance data

The ICC will devise an annual action plan to provide clinical areas with regular feedback about their antibiotic usage. The infection control team will provide feedback of healthcare-associated infection surveillance data to clinicians.

10.3 RESTRICTIONS ON ANTIBIOTIC USAGE

Restrictions on antibiotic prescribing will never be recommended by the ICC for cost reasons because this is outside of the remit of the group. Antibiotic restrictions will only be implemented with the aim of reducing healthcare-associated infections.

Note: Refer hospital antibiotic policy for details.

11 CARE OF SYSTEMS AND INDWELLING DEVICES

General guidelines to be followed for all procedures:

- Hand hygiene is mandatory before, after and in-between procedures and patients.
- Each health care worker should be familiar with the personal protection (Standard precautions) required for each procedure. These precautions should be strictly adhered to.
- Follow proper waste segregation & disposal after each procedure.

11.1 VASCULAR CARE

1.1 Establish the vein prior disinfection .Upper extremity preferred over lower extremity

Hand Hygiene: Wash hands before every attempted intravascular catheter insertion using antimicrobial soap or use a hand rub

Preparation of skin:

Two swab method, with isopropyl alcohol and 10% Betadine alternatively or tincture of aqueous chlorhexidine gluconate may be used for cleaning the skin. Insertion sites should be scrubbed

with a generous amount of antiseptic. Beginning at the centre of the insertion site, use a circular motion and move outward. Wait till the skin dries before insertion.

- Do not touch the site ungloved after disinfection. Do not reuse a vascular access device.
- Transparent dressing is preferable.

Inspecting catheter insertion sites

Intravascular catheters should be inspected daily and whenever patients have unexplained fever or complaints of pain, tenderness, or drainage at the site for evidence of catheter related complications. Inspect for signs of infection (redness, swelling, drainage, tenderness) or phlebitis and also palpate gently through intact dressings.

Manipulation of intravascular catheter systems

Strict aseptic technique should be maintained when manipulating intravascular catheter systems. Examples of such manipulations include the following:

- Placing a heparin lock
- Starting and stopping an infusion
- Changing an intravascular catheter site dressing
- Changing an intravascular administration set

11.1.6 Flushing IV lines

- Solutions used for flushing IV lines should not contain glucose which can support the growth of micro-organisms. Do not reuse syringes used for flushing. One syringe/Prefilled syringe is used for flushing only one IV line once.

11.2 CARE OF PERIPHERAL IV SITES (SHORT TERM CATHETERS):

Dressing Changes

Peripheral IV site dressings should not usually require routine changes, since peripheral IV catheters, should be changed within 72 hours.

Replacement of Peripheral IV Catheters

Peripheral lV catheters should be removed 72 hours after insertion, provided no IV-related complications, requiring catheter removal are encountered earlier. A new peripheral IV catheter, if required, may be inserted at a new site.

CENTRAL INTRA VASCULAR CATHETERS (LONG TERM CATHETERS):

Dressing changes

Central IV catheter dressings should be changed every 2 days for gauze dressing or every 7 days for Tegaderm.

Replacement of central IV catheters

Central IV catheters do not require routine removal and reinsertion. The catheter can be kept for a maximum of 3 months or as per the manufacturer's instructions, provided there is no sign of catheter related infection or other complications.

11.4 CATHETER RELATED INFECTION:

At the time of catheter removal, the site is examined for the presence of swelling, erythema, lymphangitis, increased tenderness and palpable venous thrombosis.

Any antimicrobial ointment or blood present on the skin around the catheter is first removed with alcohol.

The catheter is withdrawn with sterile forceps, the externalized portion being kept directed upward and away from the skin surface.

If infection is suspected, after removal, the wound is milked in an attempt to express purulence. For 5.7 cm catheters, the entire length, beginning several millimetres inside the former skin surface catheter interface, is aseptically cut and sent for culture.

With longer catheter, (20.3 cm and 60.9 cm in length), two 5-7 cm segments are cultured a proximal one beginning several millimetres inside the former skin catheter interface and the tip.

Catheter segments are transported to the laboratory in a sterile container.

Send peripheral blood culture along with culture tip.

Three way with extension is used only when multiple simultaneous infusions or Central Venous Pressure monitoring are required.

12.0 RESPIRATORY CARE

- In addition to the general guidelines that are to be adhered to, the following should also be noted with regard to respiratory care:
- Mouth flora influences development of nosocomial pneumonia in ventilated patients. Frequent chlorhexidine mouthwashes minimize the chances of pneumonia.

Ventilator

Use non-invasive ventilation to reduce the need or shorten the duration of endotracheal intubation.

Unless contraindicatedaa by the person's condition, perform orotracheal rather than nasotracheal intubation.

Perform intubation with sterile technique after procedural hand wash with antimicrobial soap or using a hand rub and sterile gloves.

Avoid frequent endotracheal (ET) intubation.

If feasible use an ET tube with a dorsal lumen above the ET cuff to allow drainage (continuous or frequent intermittent suctioning) of tracheal secretions that accumulate in the subglottic area. Before deflating the cuff of the ET tube in preparation for tube removal or before moving the tube ensure that secretions are cleaned above the tube cuff.

13.0 Before manipulation of the tube / suctioning hand hygiene is important.

14.0 If multiuse closed catheter is used no routine change of catheter is required.

15.0 If open system suction is used, use a sterile single use catheter. Use only sterile fluid to remove secretions from the suction catheter, if the catheter is to be used for re-entry into the patient's lower respiratory tract.

16.0 Change the breathing circuit (ventilator tubing and exhalation valve) that is in use every 5 days once.

17.0 Do not routinely sterilize or disinfect the internal machinery of mechanical ventilator.

18.0 Periodically drain and discard any condensate that collects in the tubing of the mechanical ventilator taking precautions not to allow condensate to drain towards the patient.

19.0 Do not routinely change the HMEF [Heat and Moisture Exchange Filter] that is in use on the patient.

20.0 Change an HMEF that is in use on a patient every 24 hr.

21.0 In the absence of any medical contraindications elevate at an angle of 30-45^0 of the head end of the bed of a patient on ventilator to prevent aspiration.

Maintain good oral hygiene to prevent colonization and subsequent aspiration of pharyngeal flora.

Use HMEF at Y connection for all patients if feasible and cost permits. It should not be removed from circuit except at the time of changing.

Oxygen masks, venture devices and nebulizer chambers are cleaned carefully and then sterilized by ETO. Disposable oxygen masks are for single use only.

Humidifier domes are ETO sterilized. Ambu bags are cleaned thoroughly and are then sent for ETO Sterilization.

12.2 Tracheostomy Care / Endotracheal Tube

Careful attention to post-operative wound care is mandatory.

The patient should receive aerosol therapy to prevent desiccation of the tracheal and bronchial mucosa or the formation of crusts. The skin around the tracheostomy tube should be cleaned with Betadine (Povidone-iodine 5%) every four hours or more frequently, if necessary.

The tracheostomy tape securing the tube should be changed every 24 hours. This tape must be tied securely at all times.

The first change of tracheostomy tube is 14 days after insertion, thereafter it should be changed weekly or as necessary.

Clean technique should be used to change the tracheostomy tube unless there is a medical indication for sterile technique.

The obturator should be at the bedside (preferably taped to the head of the bed) to be used if the tracheostomy tube accidentally is dislodged or is removed for any reason.

12.3 Suctioning of endotracheal / tracheostomy tube

Employees should be instructed and supervised by trained personnel in proper technique before performing this procedure on their own. Assess the patient using auscultation, ECG, (if available) and vital signs prior to suctioning.

Wash your hands.

Use a catheter with a blunt tip.

The wall suction should be set no higher than 120 mm Hg for adults and between 60 and 80 mm Hg for children.

Attach the suction catheter to the suction tubing; do not touch the catheter with bare hands (leave it in its protective covering).

Put on sterile gloves. The wearing of a mask is also strongly recommended.

However, if saline does need to be instilled, '1/2 cc of sterile saline is put into the tracheostomy tube on inspiration only.

If on a respirator, pre-oxygenate the patient by connecting the resuscitation bag to the artificial airway and ventilating the patient with three or four deep breaths. A mechanical ventilator on 100% oxygen may also be used by depressing the manual ventilation button three or four times.

Insert the catheter gently through the inner cannula until resistance is met. Do not apply suction during insertion.

Withdraw the catheter approximately 1 cm and institute suctioning.

Carefully withdraw the catheter, rotating it gently between the thumb and forefinger applying intermittent suctioning.

Continuous suctioning for longer than 10 seconds may create an unacceptable level of hypoxia.

The patient should be given time to rest between suctioning episodes. If possible, this time should be from two to three minutes. If the patient is receiving oxygen or ventilator support, reapply the oxygen or ventilator for at least two minutes before re-suctioning.

Observe for unfavorable reactions such as increased heart rate, hypoxia, arrhythmia, hypotension, cardiac arrest, etc.

If oral suctioning is necessary, it should be done after the tracheostomy is suctioned.

When suctioning is completed, clear the catheter and tubing of mucous and debris with sterile water or saline.

Discard the catheter, water container, and gloves appropriately.

Wash hands.

12.3.18 The tubing and suction canister should be changed every 24 hours. The canister should be labelled with the date and time when they are changed. If debris adheres to the side of the tubing or the canister, either or both should be changed. The tubing should be secured between suctioning periods so that it will not fall to the bed, floor, etc.

12.4 PREVENTION OF URINARY TRACT INFECTIONS

Personnel

Educate personnel in correct techniques of catheter insertion and care.

Periodically re-educate personnel in catheter care.

Catheterize only when necessary. Condom catheter drainage, suprapubic catheterization, and intermittent urethral catheterization can be useful alternatives to indwelling urethral catheterization.

Use smallest suitable bore catheter consistent with good drainage and to minimize urethral trauma.

Procedural hand washing with antimicrobial soap or use hand rubs.

Insert catheter using aseptic technique and sterile equipment. Use sterile gloves, sterile drapes, swabs , single packet of lubricant jelly and antiseptic solution (betadine).

Secure catheter properly to prevent movement and urethral traction.

A sterile continuously closed drainage system should be maintained.

The collecting bag should be emptied regularly using a separate collecting container for each patient .The draining spigot and non-sterile container should never come in contact.

The collecting bags should be kept below the level of the bladder.

The catheter and the drainage tube should not be disconnected unless the catheter must be irrigated.

If breaks in aseptic technique, disconnection, or leakage occur, the collecting system should be replaced using aseptic technique after disinfecting the catheter tubing junction.

Routine irrigation and use of antimicrobials for irrigation should be avoided.

To relieve obstruction due to clots, mucus, or other causes, an intermittent method of irrigation may be used.

If small volumes of fresh urine are needed for examination, the distal end of the catheter, or preferably the sampling port if present should be cleansed with a disinfectant and urine then aspirated with a sterile needle and syringe.

Larger volumes of urine for special analysis should be obtained aseptically from the drainage bag.

Daily meatal care with povidone iodine solution and daily cleansing with soap and water does not reduce the incidence of UTI and is not routinely recommended.

To minimize the chances of cross infection, infected and uninfected patients with indwelling catheters should not share the same room or adjacent beds.

Regular bacteriologic monitoring of catheterized patients is not recommended.

Catheter Use

The catheter and the collecting tube should be kept from kinking.

The catheter tubing junction should be disinfected before disconnection. A large volume sterile syringe and sterile irrigant should be used and then discarded .The person performing irrigation should use aseptic technique.

If the catheter becomes obstructed and can be kept open only by frequent irrigation, the catheter should be changed if it is likely that the catheter itself is contributing to the obstruction.

Indwelling catheters should not be changed at arbitrarily fixed intervals but should be removed as soon as not needed.

Hand washing

Hand washing should be done immediately before and after any manipulation of the catheter site or apparatus.

Anchoring the catheter

Strapping of the catheter is done to lateral side of thigh in male patients. This is to prevent direct transmission of the weight of the bag on the catheter, so that pulling and inadvertent dislodgement of the catheter does not occur. This also helps to prevent stricture of the penile urethra if the patient is on a catheter for a long duration.

7 PREVENTION OF SURGICAL SITE INFECTIONS

Preoperative

Identify and treat all infections remote to the surgical site before elective operation and postpone elective operations on patients with remote site infections until the infection has resolved.

Do not remove the hair preoperatively unless the hair around the incision site will interfere with the operation.

Hair should be removed immediately before the operation, preferably with electric clippers or depilatory cream.

Adequate control of blood glucose levels in diabetic patients.

Preferably patients should shower or bathe with chlorhexidine 4 % twice preoperatively or at least the night before the operation day.

Keep preoperative hospital stay as short as possible.

Perioperative

Keep nails short. Do not wear hand or arm jewellery.

Perform a preoperative surgical scrub for at least 3 min using an appropriate antiseptic .Scrub the forearms up to the elbow ,cleaning underneath each finger nail prior to performing first surgical scrub of the day .After performing the surgical scrub , keep the elbows in flexed position allowing the water to run from the fingertips towards the elbow. Dry hands with a sterile towel and don sterile gown.

Wear a surgical mask that fully covers the mouth and a cap or hood that fully covers the head when entering the OT room.

Wear sterile gloves after donning a sterile gown. Use surgical gowns and drapes that are effective wet (materials that resist liquid penetration).

Change scrub suits that are visibly soiled, contaminated or penetrated by blood or potential material.

Thoroughly clean at and around the incision to remove gross contamination before performing antiseptic skin preparation.

Apply preoperative antiseptic agent (70 % alcohol, 10 % /7.5% Povidone iodine, chlorhexidine gluconate) in concentric circles moving towards the periphery. The prepared area must be large enough to extend the incision or new incisions or drain sites , if necessary .

Follow the hospital policy for antibiotic prophylaxis.

Follow strict asepsis in OT and use only sterile instruments.

Handle tissues gently, maintain effective haemostasis, minimize devitalised tissues and foreign bodies (sutures, charred tissues, necrotic debris) and eradicate dead space at the surgical site.

Use delayed primary skin closure or leave an incision open to heal by second intention if the surgeon considers the surgical site to be heavily contaminated.

If drainage is necessary, use a closed suction drain. Place a drain through a separate incision distant from the operative incision .Remove the drain as soon as possible.

Post-operative

Protect with a sterile dressing for 24-48 hrs post operatively, an incision that has been closed primarily.

Surgical wounds after an elective surgery are inspected on the third post-operative day, or earlier if wound infection is suspected.

All personnel doing dressings should wash their hands before the procedure. Ideally, a two member technique is followed. One to open the wound and one to do the dressing.

If two health care workers are not available, then, take off the dressing, wash hands again before applying a new dressing.

A clean, dry wound may be left open without any dressing after inspection. If there is any evidence of wound infection, or purulent discharge, then dressings are done daily, using povidone-iodine to clean the wound and applying dry absorbent dressings.

7.13 Antibiotic prophylaxis for surgery

13.4.1 Antibiotic timing

- The first antibiotic dose can be given any time within 60 min preceding the surgical incision preferably just before induction of anaesthesia .For surgery for more than 4 hours the antibiotic dose should be repeated.

13.4.2 Duration of prophylaxis

- Prophylactic antibiotics should be discontinued within 24 hours after the end of surgery

* Note : For preoperative antibiotic prophylaxis refer antibiotic policy.

8 DISINFECTION AND STERILIZATION

15.1 Policy: Disinfection and sterilization

There will be an itemized list of all patient care practices together with particulars of the disinfectant to be used and the details of the procedure. Routine supervision to ensure that the disinfectants are used according to the instructions. Regular in-use testing is usually required to check the efficiency of disinfection procedures and proper use of disinfectants.

The infection control team is responsible for the training of potential users of disinfectants and continuing education of employees and professional staff on the proper use of disinfection.

15.2 DEFINITIONS

Any micro-organism, including bacterial spores that come in contact with normally sterile tissue can cause infection. All items that come in contact with normally sterile tissues should be sterilized. Bacteria and viruses can be transmitted to patients on instruments or equipment. These must be decontaminated between patients.

15.2.1 Types of items

CLASSIFICATION	ITEM USED	INFECTIOUS RISK	APROPRIATE PROCESS
Critical Items	Instruments or objects that are introduced directly into the bloodstream or into other normally sterile areas of the body. Examples are surgical instruments, needles, cardiac catheters, implants, and the blood compartment of haemodialysis	**High** (Objects should be free of microorganisms including spores)	Steam sterilization or Low temperature methods. Ethylene oxide, Hydrogen peroxide, plasma etc
Semi Critical Items	Come in contact with intact mucous membranes, but they do not ordinarily penetrate body surfaces eg, Endoscopes, cystoscopes, laryngoscope blades and anesthetic equipment	**High, Intermediate** (objects should be free of all micro organisms with reduced number of bacterial spores)	High level disinfection, thermal/chemical (Gluteraldehyde, opiod)
Non Critical items	Objects that come in contact with intact skin but	**Low** (Objects should be	Low level disinfection and cleaning

	not mucous membranes. eg. BP cuffs, Bed pans, crutches. Bed rails Linen etc	clean)	

Cleaning

Is the removal of contaminates e.g. soil, organic matter, and large number of microorganisms. Cleaning is a useful and essential prerequisite to any sterilization or disinfection procedure.

Disinfection

It is the destruction of most forms of micro-organisms but not usually of bacterial spores thus reducing them to a level that is not harmful to health.

Sterilization

A (closely monitored) validated process used to render a product free of all forms of viable organisms including all bacterial endospores.

Decontamination

The removal of pathogenic micro-organisms from objects so that they are safe to handle.

Germicide

Anything that destroys micro-organisms, particularly pathogenic organisms (germs). Usually refers to chemicals that will destroy pathogens but not necessarily spores. Germicides apply to

compounds used on both living tissue and inanimate objects while disinfectants are applied only to inanimate objects.

15.2.6 Antiseptic

A chemical used externally or on the skin or in and around wounds in order to control surface microbial contamination that could cause infection.

Levels of Disinfectant Activity

The proposed levels of activity (high, intermediate and low) are based on the fact that micro-organisms can be categorized into several groups according to their innate resistance levels to a spectrum of physical or chemical germicidal agents:

High Level Disinfection: a germicide that kills all microbial pathogens except large number of bacterial spores, the minimum treatment for critical or semi- critical instruments. An essential property of a high level disinfectant is a demonstrated level of activity against bacterial endospores.

Intermediate Level Disinfection: does not necessarily kill bacterial spores, but inactivates M. tuberculosis. It is also effective against fungi as well as lipid and non-lipid medium sized and small viruses.

Low Level Disinfection: rapidly kills most vegetative forms of bacteria and most fungi as well as medium sized or lipid-containing viruses.

15.4 RESPONSIBILITIES

Supervisor for area performing sterilization procedures develops sterilization policies and procedures for their area by liaison with the Infection Control Team.

Infection Control Team monitors adherence to the above policy.

15.4.3 Central Sterile Supply Department staff monitors the sterilization process by using biological and non-biological indicators of steam penetration.

15.5 RECOMMENDATIONS

Cleaning

All objects to be disinfected or sterilized should first be thoroughly cleaned to remove all organic matter (blood and tissue) and other residues.

Methods of Sterilization

- Steam under pressure (autoclaving) at, for example, 121°C for 20 min and 134^0C for 5 min in the Central sterilizing department.
- Whenever Sterilization is indicated, a steam sterilizer should be used unless the object to be sterilized will be damaged by heat, pressure or moisture, or is otherwise inappropriate for steam sterilization. In this case, another acceptable method of sterilization should be used.
- Bowie Dick air removal test has to be done before autoclaving the first load of the day.
- Dry heat in the Hot air oven at 160^0C for 120 min for surgical instruments that cannot be autoclaved, paraffin, etc.
- Exposure to Ethylene oxide gas.
- Immersion in Gluteraldehyde for prolonged period.

15.6 Biological Monitoring of Sterilization

15.6.1 All sterilizers shall be monitored weekly once with commercial preparation of spores intended specifically for that type of sterilizer (i.e.**Geobacillus stearothermophilus** for steam sterilizers and **Geobacillus atrophaeus** [formerly subtilis] for Ethylene oxide and Dry heat sterilizers).

Every load that contains implantable objects should be monitored. These implantable objects should not be used until the spore test is found to be negative at 48 hours.

If spores are not killed in routine spore tests, the sterilizer should immediately be checked for proper use and function and the spore test repeated. Objects, other than implantable objects, do not need to be recalled because of a single positive spore test unless the sterilizer or the sterilization procedure is defective.

If the spore tests remain positive, use of the sterilizer should be discontinued until it is serviced.

Process challenging devices (PCD) is used daily once in one load.

Use and Maintenance

The manufacturer's instruction should be followed for use and sterilizers maintenance.

Chemical Indicators

Chemical indicators that will show a package has been through a sterilization cycle should be visible on the outside of each package that is sterilized. Both internal and external indicators are used.

Use of Sterile Items

An item should not be used if its sterility is questionable, e.g. if its package is punctured, torn or wet.

General Guidelines for Sterilization and Disinfection

Disposable items are single use and should not be re-used.

Any item should be scrupulously cleaned before sterilization or disinfection.

15.10.3Multi-use items which can be sterilized by heat should be cleaned and sent to CSSD.

15.10.4Any item should be assessed individually for the level of disinfection required and the disinfectant used.

15.10.5All the variables that influence the efficacy of disinfectants should be closely monitored to achieve the level of disinfection required.

15.11 CLEANING, DISINFECTION & STERILIZATION POLICY FOR THE FOLLOWING

GENERAL OUTPATIENT EQUIPMENT

EQUIPMENT	FREQUENCY OF CHANGE	RECOMMENDATION
Oral Thermometer	After each patient.	Individual for each patient. The thermometer is disinfected by wiping with a swab saturated with 70% isopropyl alcohol. Each thermometer is kept in a separate dry holder. After each outpatient session, the thermometer holder is washed in warm water and detergent, and the thermometer is disinfected in alcohol 70% for 5 minutes.

Rectal Thermometer	After each patient	Thoroughly wash with detergent and water then dry. Store dry and separately from oral thermometers. Disinfect with alcohol 70% for 5 minutes.
Auriscope	After each patient	Disposable Earpieces should be used where possible, when not available clean in detergent and water. Disinfect in CSSD or alcohol 70% for 5 minutes.
Ear Pieces	After each patient	Wash with hot water and detergent store dry. Disinfect in CSSD or alcohol 70% for 5 minutes.
Manikins	After each session After each person practices	Wash with hot water and detergent and store dry. Disinfect faces with 70% alcohol using an alcohol wipe.
Patient shaving **(Pre op)**	After each patient	Use disposable OR shaver blade not a razor

Sphygmomanometer **Cuffs**	As required	Change covers regularly (1x/week) and washes inflatable section in detergent and water dry thoroughly in sunlight .

Equipment	**Recommendation**
Bed ends and frames	Clean with detergent and water.
Bowls-Bedpans / Urinals	Heat disinfection in 2% sodium hypochlorite solution for 5 minutes, then they are washed with soap and water and dried in sunlight.
Bowls (Washing)	Clean with detergent and water and store dry or as above.
Cleaning cloths, brushes and Equipment	Should be supplied daily from the laundry. They are provided for use and then discarded to wash. Wash brushes and buckets in detergent and water, then hang or invert to dry then store dry. Disposable cloths are also available.
Crockery	Wash with hot water and detergent. Keep dry.
Curtain Rails	As for bed ends.

Hand Basins	Clean with detergent and water.
Kitchens	A high standard of cleaning is to be achieved by the use of detergent and hot water. Sodium hypochlorite solution 0.5% strength is the recommended disinfectant.
Lockers	Detergent and water as necessary and after patient discharge.
Mattresses and Pillows	All should be covered with an impervious plastic cover and are to be wiped over with detergent and water if visibly contaminated. Mattresses should be cleaned regularly and if contaminated with the covers removed and if possible kept in sunlight for 24 hours. Plastic and rubber covers of mattresses and pillows, they are washed with soap and water, cleaned with a suitable disinfectant e.g.2% Sodium hypochlorite with a contact time of 5 min.
Mop Heads	Daily cleaning of mops. At the completion of each task of floor mopping, the mops should be thoroughly washed in a bucket containing HOT water and detergent. Squeeze as much water out of mop as possible and shake strands loose; leave hanging to dry in the sun if possible, or alternative, in the cleaner's room. The bucket is to be turned upside down to allow overnight drainage. Detachable mop heads are to be sent to the laundry, while reusable mops are to be cleaned in hot soapy water, then left to dry ideally in the sun.

Nail Brushes	The use of nailbrushes is discouraged as they cause skin damage that can cause an increase in bacterial flora. If a nailbrush is required, a sterile, antiseptic impregnated brush can be used. Reusable brushes require autoclaving between uses.
Toilet Bowls	At least daily brushing with a commercial bowl cleanser. Additional cleaning as necessary for stubborn stains.
Toilet Brushes	Should be rinsed in flushing water, and stored to dry.
Walls	Remove visible soiling with detergent as necessary.
Clinic Trolleys	Clean with a cloth dampened with detergent and water.

15.12 SPECIALIST OUT-PATIENT EQUIPMENT

A toothbrush may be used for cleaning the instruments. Workers should be asked to wear utility gloves while cleaning instruments.

ENT EQUIPMENT	FREQUENCY OF CHANGE	RECOMMENDATION
Nasal endoscopes (ENT)	Between each patient	Wash with neutral detergent; immerse in 2% gluteraldehyde [Cidex] for 10 min. Rinse thoroughly in tap water and dry.
Rigid Endoscope (ENT)	Between each patient	Wash with neutral detergent; immerse in 2% gluteraldehyde [Cidex] for 10 min. Rinse thoroughly in tap water and dry.
Laryngeal Mirrors (ENT)	Between each patient	Wash in detergent and water, dry and wipe with a swab impregnated with 70% alcohol. Laryngeal mirrors from the OR to be returned to CSSD.

EYE CLINIC EQUIPMENT	FREQUENCY OF CHANGE	RECOMMENDATION
Diagnostic contact and laser lenses (Eye Clinic)	Single Use	Single use or wipe with 70% alcohol.
Eye Drops (Eye Clinic)	Single Use	Unit of drops only to be used.
Eye Covers **Pin Holes-Used for testing**	Between each patient	Pinhole eye covers must be wiped with a swab impregnated with 70% alcohol.
Pachymeters (Eye Clinic)	Between each patient	Wipe with a swab impregnated with 70% alcohol.
Slit Lamp (Eye Clinic)	Between each patient	Wipe with a swab impregnated with 70% alcohol.
Tonometer heads (Eye Clinic)	Between each patient	Wipe with a swab impregnated with 70% alcohol.
Transducers **(Eye Clinic)**	Between each patient	Wipe with a swab impregnated with 70% alcohol.

DENTAL CLINIC EQUIPMENT	FREQUENCY OF CHANGE	RECOMMENDATION
Intraoral X-ray film packets	Between each patient	Wash with neutral detergent rinse and dry immerse in 2% gluteraldehyde for 20 minutes.
Bite block	Disposable cover should be used or between each patient	Wash with neutral detergent rinse and dry immerse in 2% glutaraldehyde for 20 minutes.
Prosthodontic and orthodontic impressions **1. Alignate impressions** **2. Zinc oxide eugenol impressions**	Between each patient	Kept in wet cotton in sodium hypochlorite, for 30 minutes. Wash with neutral detergent rinse and dry immerse in 2% gluteraldehyde for 20 minutes.
Hand pieces	Between each patient	Ideally should be autoclaved. If this is not possible it should be wiped and wrapped in Providone idodine solution for 10 minutes after running the air rotor with the water channel for 20 seconds

Burs, reamer, files used for root canal treatment (RCT) of cavities	Between each patient	Cleared of debris and disposed after single use or autoclaved or immersed in 2% gluteraldehyde permanently It is also suggested that there be a holding solution into which burs and endodontic instruments can be dropped after the use in any patient

15.2ANAESTHETIC EQUIPMENT

EQUIPMENT	FREQUENCY OF CHANGE	RECOMMENDATION
Ambu Bags	After each patient	Heat disinfect in hot water. If equipment is heat sensitive, wash in detergent and water then dry thoroughly.
Airways	After each patient	Wash and brush thoroughly in detergent and water to remove all debris, then rinse and dry. Package and autoclave. Disposable discard.

Anaesthetic Tubing	If bacterial/viral filter used, change circuit between patient and filter, after each patient. Change remainder of the circuit at the end of the list. If filter not used, change complete circuit after each patient.	Chemical or thermal disinfectors. Dry thoroughly. Disposable discard.
Breathing bags and sets and self-inflating resuscitator sets including valves	As above	These items should be disassembled and washed with detergent and hot water and dry well.
Catheter Mounts	After each patient	Wash and brush thoroughly in detergent and water to remove all debris, then rinse and dry. Package and autoclave.
CO_2 Sampling Tubing	As necessary	Wash in detergent and water
Endotracheal Tubes **Laryngeal Masks if Reusable**	After each patient	Wash and brush thoroughly in detergent and water to remove all debris, then rinse and dry. Package and autoclave.
Face Masks	After each patient	Heat disinfect.

Laryngoscopes	After each patient	Separate blade from handle. Remove bulb. Clean bulb and blade in detergent and water. Heat disinfect blade. Blade can also be autoclaved. Wipe over handle with detergent and water.
Nebulisers	After each patient	Disposable or soap and water
Soda Lime Absorber	Change when wet or indicated by colour change (white-blue)	Disposable
Suction Tubing	Discard after each patient	Disposable
Ventilator Bellows	Weekly. The frequency of change is indicated by usage.	Clean with detergent and water allow to dry. Autoclave if able

***** ***Note***: All ventilators and anaesthetic machines should be protected by using single use patient end bacterial / viral filters**.**

15.14 RESPIRATORY EQUIPMENT

PURPOSE: To ensure that staff follows proper evidence based practices for the Cleaning Disinfection and Sterilization of Respiratory Equipment to minimize the risk of Infection to Staff and patients.

RESPONSIBILITY: Nurses and Staff handling such equipment.

EQUIPMENT	PPE/STANDARD PRECAUTIONS	CLEANING, DISINFECTION, STERILIZATION	WHEN TO DISPOSE/ CLEAN	DISPOSAL
O2 Nasal Prong, O2 Face mask with tube, Venturi mask, High Concentration Mask, Nebulizer	Hand Hygiene with Alcohol rub before and after use wear gloves if contaminated with respiratory secretions.	Disposable Alcohol swab	• If grossly contaminated • If malfunctioning • When care is discontinued (Routine time bound change not necessary)	(Disposable Polyethylene) Cut and dispose into Blue Plastic bag
Metal outlet of Oxygen supply that connects to plastic tube	Hand Hygiene with Alcohol rub before and after use	Wipe with Soap and water Solution	When care is discontinued, Once a day	Reusable
Laryngoscope	Hand hygiene Gloves	• Separate blade from handle. • Remove bulb. • Clean bulb with alcohol swab and	After patient use	

		blade in detergent and water. • Autoclave blade Orplace in Glutaraldehyde for 20 min /Cidex OPA for 12 min • Wipe over handle with detergent and water. • In crash carts: Reusable after autoclaving, after checking, wipe with isopropyl/ethyl alcohol. • Store till next patient use		
BIPAP MASK **HEAD STRAP**	Hand Hygiene with Alcohol rub before and after use. Wear Gloves if contaminated with respiratory secretions	Tubing: Clean with detergent and water. Mask: Reusable for same patient/disposable Filter: by biomedical dept. as per manufacturer's instructions Filter: rinse & clean with soapy water	Filter: Change filter as per manufacturer recommendations /malfunctioning Mask Tube , if grossly contaminated or if malfunctioning.	Mask reusable for same patient or dispose.

		once a week, dry before use.	When care is discontinued or tube is weakly discoloured after frequent sterilization, log of number of cycles of sterilization to be maintained on tubing (Routine time bound change not necessary) Mask: reusable or single use	
Ambu Bag	Hand hygiene Gloves	Clean thoroughly with detergent and water open valve, autoclave. Alternatively disposable bags can be used	Between each patient use	Cut and into blue bag
Oxygen Flow Meter	Hand Hygiene with Alcohol rub before and after use	Rinse in detergent and water, soak in 2% Na Hypochlorite solution for 5	When in continuous use for a patient : Clean once a day	Reusable

		minutes. Rinse with running tap water, dried and fix back. Keep 3/4th full with sterile water when not in use. Keep dry.	When care is discontinued	
Nebulizer	Hand Hygiene with Alcohol rub before and after use	After each treatment, the residual fluid should be discarded & cleaned with detergent and disinfected. Use only sterile liquid for nebulization and use gloves for dispensing	Change every 24 hours for same patient? Use new chamber and mask for each new patient. When care is discontinued: same as nasal prongs	Reusable When disposed: cut and place in blue bag
Suction Equipment	Hand hygiene Gloves	Bottle: When in use for same patient, when its 3/4th full discard secretion into washing drain. Wash bottle, soak in 1% sodium hypochlorite for 30 minutes,	After use, or at every shift change Cap of bottle & metal connecter When in continuous use	Bottle: Reusable

		wash, dry and reconnect. In between patients, soak in 1% sodium hypochlorite for 30 minutes, wash, dry Keep jar empty and dry when not in use Cap of bottle & metal connecter Wipe over with 1% hypochlorite solution, Tubing: Fresh tube for each use or maximum after 6 hours on same patient Use only sterile water for cleaning in between if required.	for a patient : Clean once a day Tubing Change after every 24 hours	Cut and dispose into blue bag

15.15Ventilator Disinfection guidelines

PART	PPE/STANDARD PRECAUTIONS	CLEANING, DISINFECTION, STERILIZATION	COMMENT	CAUTION
Ventilator Exterior (including the touch screen and flex arm)	Hand hygiene Gloves	Wipe clean with damp cloth and mild solution or with one of their equivalents. Use water to rinse off chemical residue as necessary. Mild dishwashing detergent Isopropyl alcohol (70% solution) Bleach (10% solution) Ammonia (15% solution) Hydrogen Peroxide (3% solution)	Do not allow liquid or sprays to penetrate the ventilator or cable connections. Do not attempt to sterilize the ventilator by exposing to ethylene oxide (ETO) gas. Do not use pressurized air clean or dry the ventilator, including the GUI vents	To avoid damaging filter materials used on the back of the GUI, do not use hydrogen peroxide to clean the GUI. To prevent damage to the ventilator labelling and ventilator surfaces in general, use only the listed chemicals to clean the

		Glutaraldehyde 3.4% solution OR 1% Nusept		ventilator exterior
Patient circuit tubing	Hand hygiene gloves	Disassemble and clean, then autoclave, pasteurize or chemically disinfect	If submerged in liquid, use pressurized air to blow moisture from inside the tubing before use. Inspect for nicks and cuts, and replace if damaged. Run SST to check for leaks when a new circuit is installed.	Steam sterilization method for ventilator patient circuits may shorten the tubing's life span. Discoloration and decreased tubing flexibility are expected side effects of steam sterilizing this tubing.
In line	Hand hygiene Gloves	Disassemble and clean, then autoclave, pasteurize or	Inspect for cracks and replace if	

water traps		chemically disinfect	damaged.	
Couplings and Connectors	Hand hygiene Gloves	Autoclave, pasteurize or chemically disinfect	If submerged in liquid, use pressurized air to blow moisture from inside the part before use. Inspect for nicks and cuts and replace if damaged	
Collector Vial	Hand hygiene Gloves	Reusable clean, then autoclave or chemically disinfect. Single patient use: Discard	Inspect for cracks and replace if damaged	
Expiratory And Inspiratory bacteria filters	Hand hygiene Gloves	Reusable: Autoclave, before discarding, disinfect or sterilize according to hospital's protocol.	Effective sterilization of Puritan Bennet Inspiratory and expiratory filters occurs by steam autoclaving at	

		Single patient use: Discard	121^0 C for 20 minutes for gravity displacement cycles. Do not chemically disinfect or expose to ETO gas. Check filters resistance before reuse. Follow manufacturer's recommendations for reusability.	
Compressor Inlet Filter	Hand hygiene Gloves	Every 250 hrs or as necessary: Wash in mild soap solution, rinse and dry	Replace filter elements if torn or damaged	
Drain bag, tubing and clamp	Hand hygiene Gloves	Discard bag when filled to capacity or circuit change. Clean and autoclave reusable	Do not autoclave clamp. Replace clamp if visibly damaged.	

		tubing. Wipe clamp clean with alcohol or pasteurize		
Air Inlet filter bowl	Hand hygiene Gloves	Wash exterior with mild soap solution if needed.	Avoid exposure to aromatic solvents, especially ketones. Replace if cracks or crazing are visible.	

OPERATION THEATRE & CRITICAL CARE AREAS

PURPOSE: To ensure that staff follows proper evidence based practices for the Cleaning Disinfection and Sterilization, to minimize the risk of Infection to Staff and patients.

RESPONSIBILITY: Nurses, Doctors and Housekeeping Staff

RECOMMENDED CLEANING SCHEDULE:

The recommended cleaning schedule includes but need not be limited to:

Immediately prior to the commencement of an operative procedure the environment should be visually inspected for cleanliness and appropriate action taken.

Spot cleaning of blood substances should be undertaken as soon as practicable with an 2% Sodium hypochlorite after a contact period of 5 min.

Cleaning after each patient should include spot cleaning of contaminated furniture, equipment, and floor .

At the conclusion of the day's operative schedule, operating rooms, anaesthetic rooms, scrub/utility areas, recovery rooms and corridors, furnishings, fixtures, fittings, flows and face plates of vent should be cleaned.

Areas	Floors	Bench tops & horizontal surfaces	Furniture & Equipment	Sinks	Waste bins	Toilets
Anaesthetic Rooms	‘’	‘’	‘’	‘’	‘’	‘’
Operating Rooms	‘’	‘’	‘’	‘’	‘’	‘’
Preparation Rooms	‘’	‘’	‘’	‘’	‘’	‘’
Recovery Rooms	‘’	‘’	‘’	‘’	‘’	‘’
All other areas	‘’	‘’	‘’	‘’	‘’	‘’

15.16.4 CLEANING SCHEDULES: DAILY

WEEKLY

AREAS	SHELVES & DESKS	CURTAIN RACKS
Preparation Rooms	‘’	‘’
Storage Rooms	‘’	‘’
Recovery Rooms	‘’	‘’
Pre Anesthesia Rooms	‘’	‘’
All Other Areas	‘’	‘’

HALF YEARLY

AREAS	CEILINGS / WALLS / DOORS	LIGHT FITTINGS	FIRE/SMOKE DETECTORS

Anesthetic Rooms	‘’	‘’	‘’
Operating Rooms	‘’	‘’	‘’
Recovery Rooms	‘’	‘’	‘’
Preparation Rooms	‘’	‘’	‘’
All Other Areas		‘’	‘’

ANNUALLY

	CEILINGS / WALLS / DOORS
All Areas	‘’

15.16.4 DISINFECTANTS TO BE USED

In OT`s , mopping of all surfaces with Microlyse solution between cases, allowing a contact time of 10 minutes.

All surfaces in the OT`s will be cleaned in the beginning of the day and at the end of day. Initial cleaning will be using detergent and water followed by 1% sodium hypochlorite with which floors .

Fumigation is done with 20 % Silvicide weekly on Saturdays or as required following scrubbing and cleaning, prepared according to manufacturer's instructions. Room should be closed & allowed to dry for 1hour afterwards.

For wet mopping in ICU`s, as per the cleaning protocol meantioned in annexure . For blood spills, sodium hypochlorite 2 % [5 min contact time] must be used promptly followed by thorough rinsing.

15.16.3Fogging of OT

For fogging use 20 % Silvicide.

SPACE			
Cu ft	**M3**	**DILUTION**	**FOGGING DURATION**
1000	28	200 ml in 1000 ml	20 min
2000	58	400 ml in 2000 ml	30 min
3000	84	600 ml in 3000 ml	60 min

15.16.4 STERILIZATION METHODS

	DRY HEAT	AUTOCLAVE	ETHYLENE OXIDE	2% GLUTARALDEHYDE
Duration	160^0C for 2 hours	121^0 C for 20 min or 134^0C for 5 min	240 min at 45^0C	20 min
Needles	-	□	-	-
Endoscopic Instruments	-	-	-	
Suction tubes	-	-	□	□
Suction bottles	-	□	□	□
Cautery Cable	-	-	-	□
Cautery points	-	-	-	□
Laryngoscope	-	-	-	□
Endotracheal Tubes	-	-	□	□
Blanket	-	-	-	-
Mattresses	-	-	-	-

Suturing needle	□	-	-	-
Blades / scissors	-	-		

15.16 CSSD

15.18.1Collection and distribution of items:

15.18.1.2 All items are collected and distributed **twice** a day.

1518.1.3 Unsterile items are brought to the CSSD and the sterile items issued.

15.18.1.4 Items which have crossed the expiry date (**30 days for sterile packs)** should be returned and new ones obtained.

Monitoring of sterilization:

All sterile items should come in packs, which are secured firmly with tapes. All packs should have the chemical indicator tape showing adequate sterilization. Users should verify this and report if there is any breach.

The autoclave has **thermocouples** that indicate the temperature inside the autoclave. **Pressure gauges** measure the pressure of the autoclave chamber.

In addition to chemical indicators, microbiological surveillance is done using Biological indicators (G. stearothermophilus spore suspensions) every week.

Chemical indicator strips both internal and external (class v integrator) are used to check each cycle per day of each autoclave. However, it is put in every instrument pack used for Transplant, implant and cardiovascular surgery.

Bowie Dick, air removal indicator test is done daily before autoclaving the first load of the day.

15.18.3 Storing, Handling and Monitoring Of Sterile Supplies

Sterile supplies must be stored in a manner to protect them from contamination and monitored to assure that expired or contaminated items are not used.

Storing sterile supplies

Store at least eight inches from the floor, two inches from outside walls and a minimum of 16 inches from the ceiling.

Store in a closed cabinet free of moisture, dust and vermin.

15.18.3.3Warehouse boxes will not be stored in a sterile storage area.

15.18.3.4Rotate supplies so that the oldest stock is used, first-principle of First in and first out.

15.18.3.5All sterile sets received from CSSD can be stored/used for/up to 30 days and sent for re-sterilization after that.

15.18.3.6All ETO sterilized items can be stored up to 1year

When using the sterile supplies, check for,

Package integrity, holes, tears, open ends.

Check outside tape for proper colour change (black for steam and green for gas.)

15.18.4.3 Packages that are dropped on the floor or become torn or wet must be considered contaminated .Return to the CSSD for reprocessing.

15.18.5 Expired sets received from patient care areas across the hospital shall be reprocessed and documented .

15.18.6 CSSD RECALL PROTOCOL

In case of any breakdown in the sterilization procedure, based on the monitoring (Chemical / biological) indicators, there is a procedure for withdrawal of items from the areas of usage.

The packs are tracked and called back for re-autoclaving.

Objective :

To ensure that any sterile goods issued suspected of being substandard is identified , quarantined , collected investigated & the findings recorded.

Procedure :

The sterile supplies issued will be recalled for reprocessing in the event of failed quality management tests .

- Packs with holes , moisture [wet packs] , discoloured ,dust & dirt.
- Items without external sterilization indicator or those with indicators that have not changed colour .
- Packs dropped on floor or on any dirty surfaces.
- Packs with broken seals .

- Failed biological indicator.
- Mechanical breakdown of the autoclave.
- Items without date of sterilization.

Traceability :

The records of all the dispatched sterile supplies will contain details of batch number, date & washer cycle number which is documented in the recall register and traceability of the batches can therefore be achieved by referral to records.

Responsibility:

A recall is authorised by the senior CSSD staff.

Recall protocol :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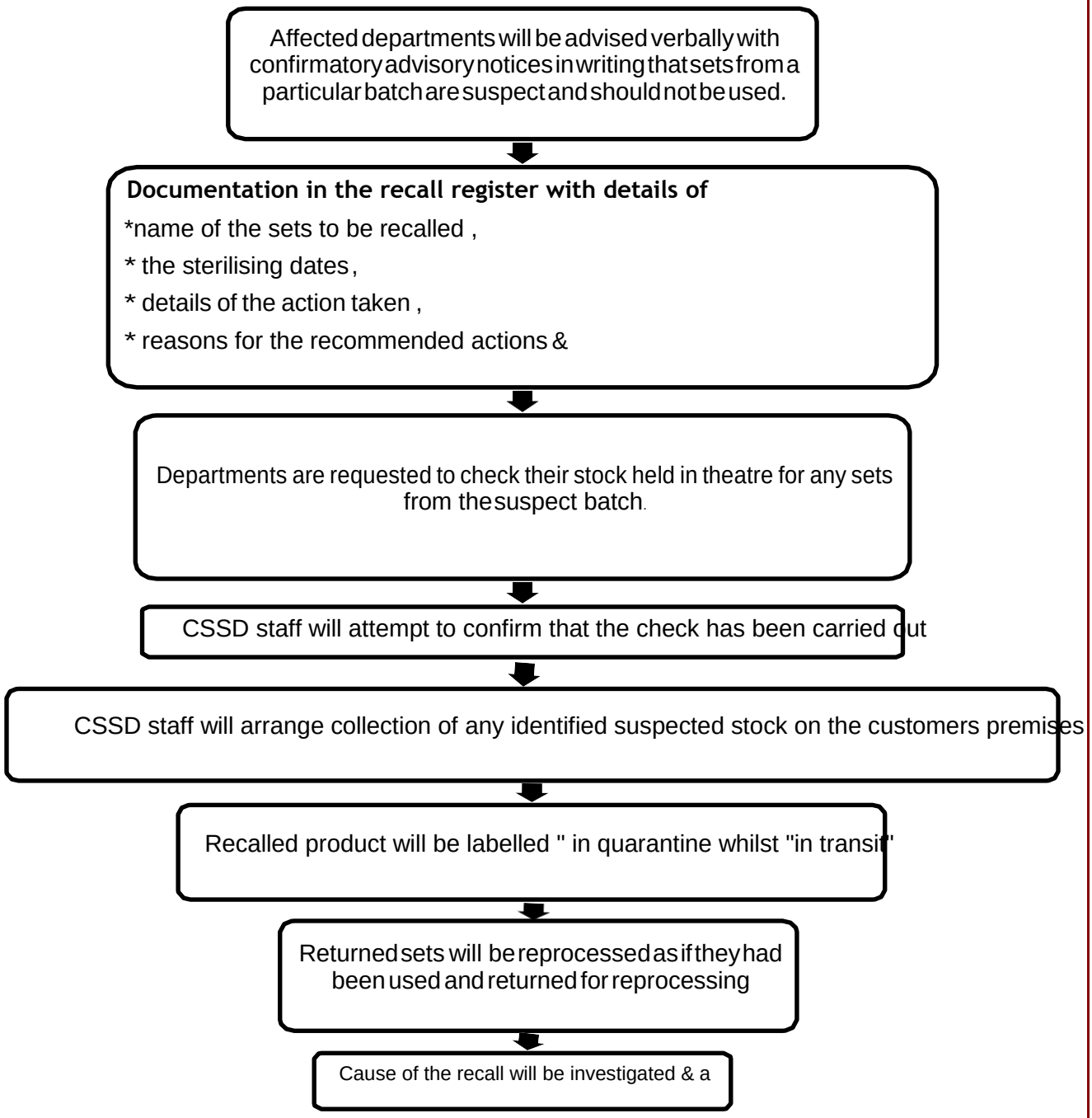
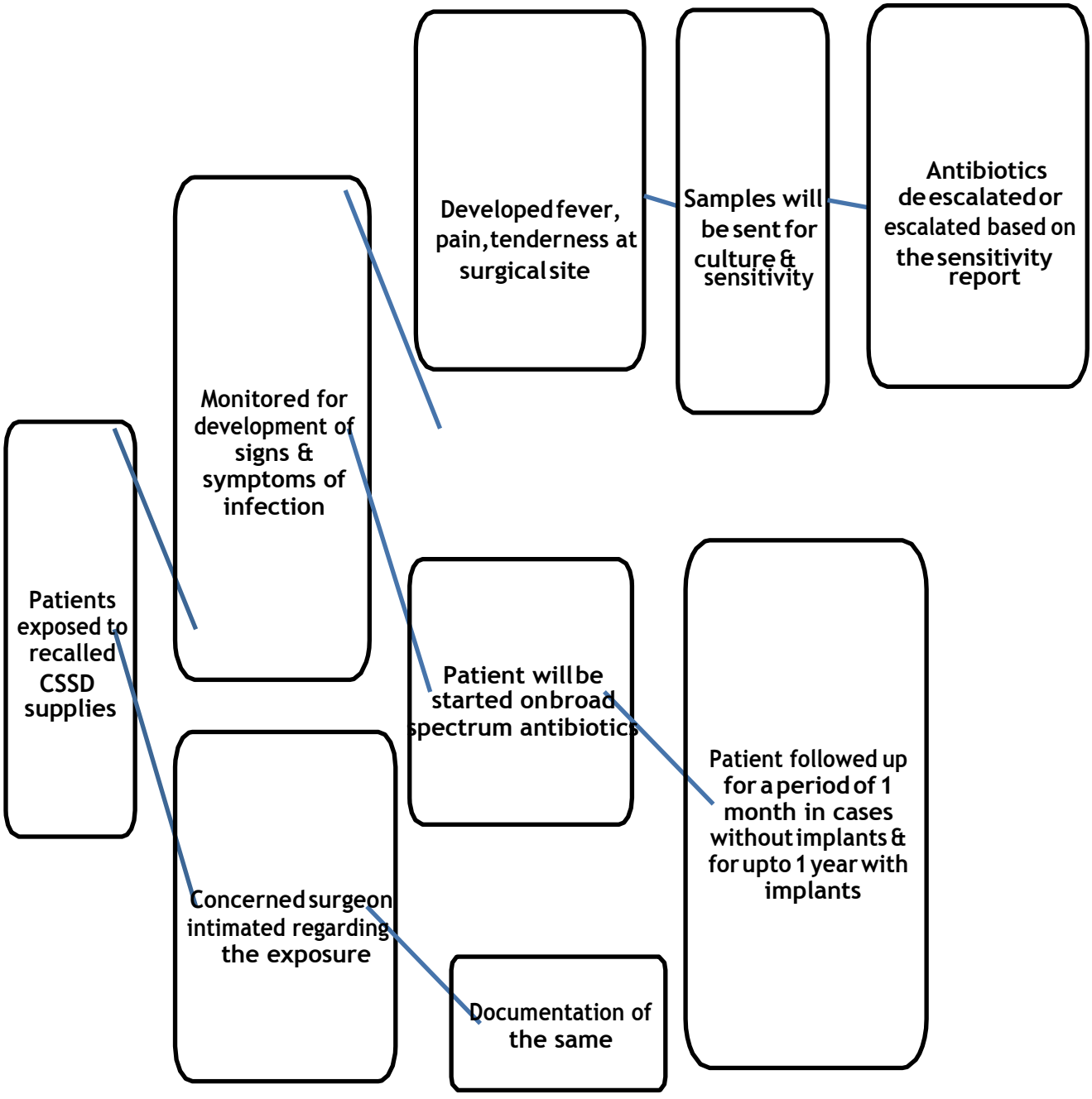

Affected departments will be advised verbally with confirmatory advisory notices in writing that sets from a particular batch are suspect and should not be used.
Documentation in the recall register with details of
*name of the sets to be recalled ,
* the sterilising dates ,
* details of the action taken ,
* reasons for the recommended actions &
Departments are requested to check their stock held in theatre for any sets from the suspect batch.
CSSD staff will attempt to confirm that the check has been carried out
CSSD staff will arrange collection of any identified suspected stock on the customers premises
Recalled product will be labelled " in quarantine whilst "in transit"
Returned sets will be reprocessed as if they had been used and returned for reprocessing
Cause of the recall will be investigated & a

15.18.1.6 Flollow up of patients exposed to the recalled CSSD supplies :



15.19 BIOMEDICAL WASTE MANAGEMENT

15.19.1 ELEMENTS OF BMW MANAGEMENT

- Segregation
- Transportation
- Pre-treatment
- Treatment
- Final Disposal

15.19.2.1 Categories and Segregation

The BMW shall be segregated into different colour coded bins at the site of generation to ensure minimum handling. No untreated BMW shall be stored beyond a period of 48 hours.

Biomedical wastes categories and their segregation, collection, treatment, processing and Disposal options – 2016 guidelines

COLOUR CODE	TYPE OF CONTAINER	CATEGORY OF WASTE	METHOD OF DISPOSAL
	Yellow coloured non-chlorinated Plastic Bag	**(a) Human Anatomical Waste:** Human tissues, organs, body parts and foetus below the viability period. **(b)Animal Anatomical Waste :**	Incineration Deep burial Plasma Pyrolysis

		Experimental animal carcasses, body parts, organs, tissues, including the waste generated from animals used in experiments or testing in veterinary hospitals or colleges or animal houses. **(c) Soiled Waste:** Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bags containing residual or discarded blood and blood components.	
	Yellow coloured non-chlorinated plastic bags or containers	**(d) Expired or Discarded Medicines:** Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc.	Expired `cytotoxic drugs and items contaminated with cytotoxic drugs to be returned back to the manufacturer or supplier for incineration at temperature >1200 0C or to common bio-medical waste treatment facility or hazardous waste treatment, storage and disposal facility

			for incineration at >12000C Or Encapsulation or Plasma Pyrolysis at >12000C. All other discarded medicines shall be either sent back to manufacturer or disposed by incineration.
	Yellow coloured containers or non-chlorinated plastic bags	**(e) Chemical Waste:** Chemicals used in production of biological and used or discarded disinfectants.	Disposed of by incineration or Plasma Pyrolysis or Encapsulation in hazardous waste treatment, storage and disposal facility.
	Separate collection system leading to effluent treatment system	**(f) Chemical Liquid Waste :** Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, Silver X-ray film developing liquid, discarded Formalin, infected secretions, aspirated body fluids**,** liquid from laboratories and floor washings, cleaning,	After resource recovery, the chemical liquid waste shall be pre-treated before mixing with other wastewater. The combined discharge shall conform to the discharge norms

		house-keeping and disinfecting activities etc.	
	Non-chlorinated yellow plastic bags or suitable packing material	**(g)** Discarded linen,mattresses, beddings contaminated with blood or body fluid.	Non- chlorinated chemical disinfection followed by incineration or Plazma Pyrolysis or for energy recovery.
	Autoclave safe plastic bags or containers	**(h) Microbiology, Biotechnology and other clinical laboratory waste:** Blood bags, Laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.	Pre-treat to sterilize with nonchlorinated chemicals on-site as per National AIDS Control Organisation or World Health Organisation guidelines thereafter for Incineration.

	Red coloured non-chlorinated plastic bags or containers	**Contaminated Waste (Recyclable)** (a) Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and *fixed needle syringes*) and vaccutainers with their needles cut) and gloves.	Autoclaving or micro-waving/ hydroclaving followed by shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent to registered or authorized recyclers or for energy recovery or plastics to diesel or fuel oil or for road making, whichever is possible. Plastic waste should not be sent to landfill sites.
	Cardboard boxes with blue colored marking	**(a) Glassware:** Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes. **(b) Metallic Body Implants**	Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling.
WHITE	Puncture proof, Leak proof, tamper proof	**Waste sharps including Metals:** Needles, syringes with fixed	shredding or mutilation or Autoclaving or Dry Heat Sterilization followed by

	containers	needles, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps	encapsulation in metal container or cement concrete; combination of shredding cum autoclaving; and sent for final disposal to iron foundries or sanitary landfill or designated concrete waste sharp pit.
BLACK	Plastic Bag	General Waste	

Changes made on BMW 2018 amendment :

a. Cardboard box with blue lining for glassware – changed into puncture proof, leak proof boxes or containers
b. Phase out use of Chlorinated blood bags – removed

15.19.2.2 Transportation

The waste is transported in covered trolleys having biohazard symbol. It is collected thrice a day or whenever the container is 3/4th full. The plastic bag also has a label indicating the source of generation & type of waste. The route of transportation to the temporary storage area is such as to avoid the high risk areas & kitchen. The temporary storage area is located away from the patient traffic & is always under vigilance. The outsourced agency vans come once a day around

2.00 pm to collect waste and it is weighed before collection.

LABEL FOR BIO-MEDICAL WASTE CONTAINERS/BAGS

 **BIOHAZARD**	 **CYTOTOXIC**

HANDLE WITH CARE
Note: Label shall be non-washable and prominently visible.

15.19.2.3Pre-treatment:

Pre –treatment is done for sharps with 2 % Sodium hypochlorite.

15.19.2.4Treatment:

The final treatment is done by the outsourced agency. A representative from hospital pays a visit once in a year to ensure that the facility is managed as per the guidelines and shall be documented.

Requisite fees, documents and reports are submitted to competent authorities on stipulated dates.

15.19.3 STAFF SAFETY CONSIDERATIONS

To ensure the safety of personnel involved in biomedical waste treatment and disposal, we follow certain policies and guidelines.

Covered trolleys with biohazard symbol are used for transportation of waste within the hospital.

All workers involved in this work are aware of the hazardous nature of this work.

The workers are provided with gumboots/shoe covers, plastic aprons, caps, masks and cloth lined thick rubber gloves.

All workers are immunized against Hepatitis B.

15.19.4 TRAINING

The hospital has a well-designed awareness and training program for all categories of workers involved in Bio-medical waste disposal and management.

Regular pre induction training shall be conducted for appropriate categories of staff before joining to the concerned department.

We have charts displayed at strategic points in all patient care areas depicting our Bio-medical waste management policy.

We have frequent workshops and training programs to promote awareness of our Bio-medical waste management policy.

16 INFECTION CONTROL IN SPECIAL CARE UNITS/ HIGH RISK AREAS

16.1 LIST OF HIGH RISK AREAS IN THE HOSPITAL

- ICU
- OT
- Post operative ward
- Cath lab
- Dialysis
- Laboratory
- CSSD
- Labour Room
- Emergency
- Waste storage Room

16.2 PURPOSE

To provide guidance for staff in all high risk areas regarding prevention of transmission of infections from one patient to another.

16.3 DEFINITION

The special precautions and measures required to prevent or minimize cross infection in high risk areas of the hospital.

POLICIES

Intensive Care Units

Design of the Unit

- Space around and between beds shall be adequate for placement and easy access to equipment and to patients.
- Good housekeeping practices shall be followed this includes regular cleaning of all areas, maintenance, linen change once daily. Clean floor at least three times a day, mornings with detergent and soap , afternoons with 1% sodium hypochlorite and evenings with 1% sodium hypochlorite .

Special precautions

Hand Washing

Gloves ,masks and aprons

Gloves mask and aprons must be worn for all procedures where contact with blood or body fluid is anticipated and for close contact with the patient e.g. lifting or turning a patient. They must be removed after each procedure and before contact with another patient.

Oral Toilet

Wear gloves when performing mouth toilets for the patient.

Nasogastric Suction

Gloves must be worn for passing nasogastric tubes. Syringes used for aspiration should be changed after each use. A clean syringe should be used if fluids or drugs are being given via the nasogastric tube.

Care Of Intravenous Lines

Aseptic technique should be used when inserting intravenous lines. Hands should always be washed before and after manipulation of these lines. The use of transparent film dressing (**tegaderm)** for dressing the cannulation site allows the insertion site to be viewed without disturbing the site. Cannulation sites dressing should be changed weekly or if it became wet or blood stained. Ensure all IV giving sets are well supported and not pulling against the patient's skin or touching the floor while being infused. Label date and time all lines changes and insertion.

Peripheral Intravenous Lines

I/V sets should be changed **every 72 hours** and always after blood transfusion. Peripheral venous catheters should be re-sited every 72 hours and should be documented.

Central Venous Lines

All arterial, central, monitoring and drug line administration sets should be **changed every 72** hours. All sets used for blood/blood products should be discarded after use. Central lines should be covered with a sterile dressing. When re-dressed, the site should be cleaned with Betadine.

The site dressing should be changed once in a week and whenever necessary. Central venous cannula should be changed every 14th day or if cannulation site is visually inflamed or if the patient is showing signs of sepsis.

Parenteral Nutrition Lines

These lines should not be used for administrating other drugs because of serious risk of infection associated with total parenteral nutrition (TPN). **Change infusion line every 24 hours**.

Percutaneous Tracheostomy Tubes

The first change of tracheostomy tube is 14 days after insertion, thereafter it should be changed weekly. The tracheostomy tube needs to be changed any time if signs of obstruction are noted (follow the manufacturer instructions),

Naso-Gastric Tube (NGT)

Wash hands and wear gloves when attaching NG feeds.

Urinary Catheter

Catheterize patients only when required.

- Stress on the importance of hand washing. Hand washing should be done immediately before and after any manipulation of the catheter site or apparatus.
- Catheter inserted under aseptic technique using sterile equipment.
- Secure catheter properly.
- Maintain closed sterile drainage.
- Maintain free urine flow.
- Use irrigation only when required (e.g. to prevent or relieve obstruction.)
- Indwelling catheters should not be changed at arbitrarily fixed intervals but should be removed as soon as not needed.

- Consider, as appropriate, alternative techniques of urinary drainage before using an indwelling urethral catheter.

Suctioning

Hands should be washed before and after the procedure. Wear clean disposable gloves for suctioning. Use saline to clean the suction tubing and after each procedure. Use disposable suction catheters for each endotracheal or tracheostomy suction procedure.

Instruments

- Although disposable items are ideal, reusable items are often used, for reducing the cost. Separate thermometers shall be used for each patient.
- Separate Ambu bag and mask should be used for each patient. This shall be ETO sterilised before use on another patient.
- All personnel working in the area must be free from respiratory and any overt wound infection, standard precautions must be followed.
- All personnel working in ICU are expected to change into the clothes and put on the slippers provided in the changing room, before entering patient care area.
- All visitors (medical and non-medical) are expected to remove their foot wear or wear overshoes before entering the ICU.

16.4.1.14 Microbiological monitoring

- Swabs for culture are taken from common dust settling areas and air conditioners as per the surveillance protocol .

16.4.1.15 Traffic and Visitor Control

In ICU, **daily one person is allowed to see the patient during** visiting hours. If the condition is critical the clergy, close relatives or friends may be permitted to see the patient in a screened area for a few minutes if the situation allows. Consideration must be made for total department

activity. Not more than one person will be allowed to visit at a time. Only visitors and personnel in proper attire will be allowed into the department. This policy will be strictly enforced at all times. There are no exceptions.

16.5 OPERATING ROOM

Guidelines for prevention of infection in OT

16.5.1 Prevention of infection in the operating room (OR) consists of the following:

16.5.1.1Practice of aseptic techniques

16.5.1.2Surgical attire

16.5.1.3Sterilization of instruments and equipment.

16.5.1.4Staff and patient skin preparation

16.5.1.5 Creation and maintenance of a sterile field

16.5.1.6Control of the environment

Critical Parameters for Operating Rooms:

Filtered air through two filter beds in series, with the efficiency of the first filter bed being $\geq$ 30 % and that of the second filter bed being $\geq$ 90%.

The filters depend on the kind of facility i.e. the use of High Efficiency Particulate Air (HEPA) filters which removes particles $\geq$ 0.3um with an efficiency of 99.97% may be reserved for high risk surgeries like orthopaedic implants surgeries OR is under positive pressure to prevent less clean air from mixing with the clean air.

There is a requirement of 25 (for general OT) & 30 (for super speciality OT) air changes per hour with a minimum of three air changes of fresh air (20%). Air should flow from the ceiling and be exhausted near the floor (3 feet above the ground level).

Temperature 20-22^{0}C, comfortable and inhibits bacterial growth (Heating systems to raise the temperature whenever required need to be provided).

Relative humidity 30-60% to slow down bacterial growth.

16.6 HAEMODIALYSIS UNIT

Employee health

High standards of personal hygiene are important.

All suspected skin, respiratory, gastrointestinal and other communicable disease shall be reported to the supervisor.

Exposure to communicable diseases shall be reported to the supervisor.

Nursing personnel shall not eat or drink in patient care areas and are immunised against HBV.

Nursing personnel exposed to blood and /or body fluids through a needle prick, splash to mucous membranes or contact with broken skin shall report the incident to the Nursing Supervisor or to the Doctor in Emergency; the Infection Control Nurse will report the incident as per hospital policy. Actions taken shall be recorded in the staff medical file.

Traffic control

Because the Haemodialysis Unit is considered a high-risk area, the following restrictions will be followed by visitors/relations:

No visitors/relations during the cannulation of the patient's fistula /graft or during dressing change of the femoral/subclavian catheter.

No visitors/relations during the time of needle removal from the fistula/graft or during dressing change of the femoral/subclavian catheter.

Visitors/relations shall be aware of the necessity of Standard Precautions through explanation from the Nursing staff or treating doctor.

If the patient eat or drink during dialysis, they may not share their food or drink with the other patients.

Cleaning/housekeeping

After dialysis for one patient is complete, all equipment will be cleaned with gloved hands and disinfected. Care must be taken to wash all surfaces at the individual station. Special care must be taken to clean the grooves in machine knobs.

All infectious waste containers and sharps containers will be located to avoid reaching and lifting and prevent dripping of blood and body fluids.

Nursing personnel shall notify the housekeeper if an area needs prompt attention.

16.6.3.4 Dialysis machines, recliner chairs and all surfaces (floors, table tops, etc.) shall be cleaned with 1% Sodium hypochlorite.

Tubings are disinfected after dialysis with 1:2 Citric acid and hypochlorite for 30 min. For HBsAg positive, 1:2 Citric acid and formalin [1 lt in 20 lt of water] for 52 min. For Dializer washing 1% H_2O_2 in 500 ml of water for 10-15 min.For tubing 1 ltr Hypochlorite in 20 ltr water for 10-15 min. Haemodialysis equipment shall be cleaned after each use according to the manufacturer's specification. The dialysis nurse and/or the technician shall clean the machine.

Thermometers

Use separate thermometer for each patient**.**

Stethoscope

Must be wiped with an alcohol swab before use by another staff.

Blood pressure cuff

Blood Pressure Cuff shall be washed & rubber tubing's shall be cleaned with sprit daily.

Isolation Precautions

The haemodialysis machine used to treat a patient, who is suspected of having a communicable disease such as Hepatitis B, shall be used for that patient ONLY. If staff must care for both HBsAg-positive and seronegative patients during the same shift, change gloves and laboratory coats and wash hands between changes, and they should be sure that no cross-contamination between areas occurs. They should use gloves whenever any patient or haemodialysis equipment is touched.

Water Treatment and Air Conditioning

During each dialysis treatment, a patient is exposed to up to 120 litres of water. Therefore, contaminants are to be purified and filtered and it must be removed from the water used in dialysis centre.

The dialysis water supplied to the dialysis unit is treated by deionization and reverse osmosis.
The filters used in the water treatment system are changed on a regular schedule using system's manufacturer recommendations.
The internal systems of the dialysis machine are cleaned weekly and/or more often if considered to be contaminated.
Samples of RO water are taken for analysis, on monthly basis, to laboratory.

17

This section deals with the units that do not necessarily come into direct patient contact but have a vital role in infection control in the hospital. Personnel in these areas have varying degrees of risk of acquiring infection. Therefore, infection control measures are to be strictly enforced in these areas.

17.6 RADIOLOGY DEPARTMENT

The various interventional procedures carried out in the department of Radiodiagnosis are:

Ultrasound guided biopsies / CT guided biopsies.

Drainage procedures.

IVU (Intravenous urogram)

MCU (Micturating cysto urethrogram). For all these procedures:

- Use sterile equipment and aseptic technique.
- Observe standard precautions strictly. All staff should be immunized against hepatitis B.
- No one with any open sores, cuts or nicks takes part in the procedure.
- Meticulous housekeeping is very important (Refer to the chapter 'Housekeeping')**.**

17.6.1.5 Ultrasound guided / CT guided biopsies:

The person doing the procedure washes up and dons sterile gloves. The part to be biopsied is painted with povidone-iodine and draped with sterile towels.

Drainage procedures:

If any infective material like pus is collected into the tray or bowl, the procedure is treated as infected. The reusable materials are separated. After the procedure, the room is mopped with 1% Sodium hypochlorite solution along with the parts of the machine that may have come in contact with the patient are cleaned with disinfectant.

IVU (Intravenous urogram):

A disposable scalp vein set is used for the venipuncture and contrast is given.

. MCU (Micturating cystourethrogram):

The perineum is prepared prior to the procedure. The perineum is painted with Povidone-iodine and draped with a sterile surgical towel. Sterile equipment is used for the catheterization procedure.

After all procedures, discard the waste generated as per the waste management guidelines.

Infectious / Isolation ward patient:

If any patient is identified as infectious beforehand, cases are adjusted such that the waiting time and transit time of this patient is minimal and spread of infection is minimal. The procedure is done preferably at the end of a session.

As far as possible only disposable equipment is used.

All re-usable things are collected in a **yellow bag** and sent to CSSD.

Linen is bagged in to an yellow bag , labelled as contaminated linen , tied and disposed to the laundry.

The room is then mopped with 1 % sodium hypochorite along with the machine parts.

Ultrasound intra cavitary probes are washed and put in 2% gluteraldehyde for 20 minutes or 0.55% Ortho-pthalaldehyde for 10 min before using on the next patient.

18 MORTUARY DEPARTMENT

Contact with whole or part human remains carries potential risks associated with pathogenic microbiological organisms that may be present in human blood and tissue. Infectious conditions in the recently deceased include-

- Blood borne pathogens such as Hepatitis viruses such as HBV, HCV, HDV
- Human immunodeficiency virus (HIV)
- Tuberculosis
- Gastrointestinal organisms
- Group A streptococcal infection
- Possibly meningitis and septicaemia

Autopsies are not handled at the HOSPITAL premises. Even so, a single exposure may cause infection. The primary ways to protect personnel who handle human remains against infectious diseases are:

- Use of PPE
- Observance of safety, hygiene, and infection control practices
- Proper handling and disposal of regulated medical waste

Immunizations recommended:

- Hepatitis B
- Tetanus

Policy

All dead bodies are potentially infectious and universal precautions should be implemented for every case. To minimize the risks of transmission of known and also unsuspected infectious diseases, dead bodies should be handled in such a way that workers exposure to blood, body fluids and tissues is reduced.

A rational approach should include staff training and education, safe working environment, appropriate work practices, the use of recommended safety devices and vaccination against hepatitis B.

There is a need to maintain the confidentiality of a patient's medical condition even after his/her death. At the same time, there is obligation to inform personnel who may be at risk of infection through contact with dead bodies so that appropriate measures may be taken to guard against infection. The discrete use of labels such as "Danger of infection" on the dead body is considered appropriate.

Bodies which are to be preserved in the mortuary are received from the respective patient care area via trolleys and are brought to the receiving area of the mortuary department and entry of patient is made in the mortuary register.

After receiving the dead body the mortuary staffs cleans the dead body.

After cleaning the body is cleaned it is wrapped in sterile linen and put inside the cold chamber under appropriate temperature/ environmental condition.

Infection Control Policies

Hygienic preparation at the Funeral (to be informed to the attendant) allowed

Recommended procedures

For Ward Staff

Hepatitis B vaccination is recommended for all staff that is likely to come into contact with dead bodies.

Avoid direct contact with the dead body, blood or body fluids discharged from the dead body. Nursing and other personnel who handle dead bodies must wear protective clothing consisting of gown, apron, mask, caps and gloves; wear goggles if necessary. They should cover all cuts and abrasions with waterproof bandages or dressing.

Wound drainage and needle puncture holes of the dead body should be disinfected with 1000p.p.m. Hypochlorite and covered with impermeable material. Hypochlorite solution must be freshly prepared.

Extreme caution should be exercised when removing intravenous catheters and other devices which are sharp. They should be disposed into puncture resistant containers or sharp box immediately.

All body orifices should preferably be plugged with swabs soaked in 1000 p.p.m. hypochlorite.

18.5.1.6 The body should be cleaned and dried.

After identifying and attaching to the body, identify label, the body should be wrapped with bed sheet before being placed on trolley and transported to the mortuary.

After removing, the protective clothing, gloves and bed sheet should be discarded as infectious wastes into yellow bags and hands should be washed thoroughly.

It is preferable for the ward staff to dress the deceased. The relatives should be informed before hand so that they can bring the necessary clothing in advance. If the decease's own clothing is not available; the decease should be dressed with a hospital pyjama.

Equipment should be autoclaved or decontaminated with disinfectant in accordance with established disinfection policy.

All surfaces that may be contaminated should be disinfected with 1000 p.p.m. hypochlorite

After removing protective clothing and gloves, hands should be washed thoroughly.

For Mortuary Staff

Hepatitis B vaccination is recommended to staff that is likely to come into contact with dead bodies.

All staff should be trained in handling dead bodies with Infections Diseases. A high standard of personal hygiene should be adopted.

Smoking, drinking and eating is prohibited during body storage and viewing areas.

The mortuary must at all times be kept clean and properly ventilated. Lighting must be adequate. Surfaces and instruments should be made of materials which could be easily disinfected and maintained.

Avoid direct contact with the dead body, blood or body fluids. Staffs who handle dead bodies must wear protective clothing consisting of gown, apron, mask, gloves and boots; wear goggles if necessary. They should cover all cuts and abrasions with water proof bandages or dressings.

All bodies must be identified and correctly labeled with identity labels.

Bodies should be stored in cold chambers maintained at approx. 4°C. Storage compartments should be easily accessible for both regular cleaning and maintenance.

Soiled linen, environmental surfaces, instruments and transport trolley should be decontaminated in accordance with established policy.

Single use gloves protective aprons and other waste materials must be discarded in yellow plastic waste bags for disposal.

After removing protective clothing and gloves, hands should be washed thoroughly.

Mortuary staff should ensure that good liaison is maintained between themselves and those who collect the dead bodies for disposal. It is essential that staff of cremation ground and all others involved in handling the dead body are informed if there is a potential risk of infection.

For Relatives of Deceased Patient

When handling dead bodies, do not smoke, eat or drink and avoid contact with their own mouth, eyes or nose with their hands.

Avoid direct contact with blood or body fluids from the dead body.

Make sure that any cuts, wounds or abrasions are covered with water proof bandages or dressings. Viewing of the face without physical contact may be permitted depending upon the instructions given by the Forensic expert

19 ENGINEERING DEPARTMENT

19.1 Policy:

After cleaning of the AHU's and CSU's it is to be sprayed with vaporized 5% Hydrogen peroxide of disinfectant (Aerox) solution and the total unit is to be aerated for 1 hour before the usage. High risk area's AHU disinfection shall be done once in 6 months .

If in case of the and air vector borne bacteria is found swabs is to be taken.

In HVAC ducts and if it is positive and the total Unit is to be fogged.

No moisture accumulation is allowed in the CSU's and AHU's so the water drains is to be checked regularly.

All the Tap filter and health faucet filter is to be cleaned every month and it is to be immersed in Sodium hypochlorite solution 1:1000 concentration.

At all given time the engineering personnel working with any of this should use the personal protective equipment's.

All the HEPA filter is to replace as per the manufacturer's instructions in all the areas where they are installed**.**

In case of problem with the suction apparatus the technician should take all the standard precautions like wearing gloves and PPE etc and disinfect with preferable disinfectant according to the manufacturer's instructions.

A very high degree of precaution is to be taken by the engineering staff while handling any equipment's relating to patients.

In case if the biological indicator or the Bowie Dick test fails in the Autoclave, it has to be immediately intimated to the Biomedical Engineer.

20 DIETARY DEPARTMENT

OBJECTIVE

To ensure proper and safe food handling starting from the receiving of raw material, storage, food preparation and up to the meal distribution.

To ensure that the food supplied by the Food and Beverages dept. for the consumption of patients, attendants & employees is free from environmental contamination and microbial contamination.

PROCUREMENT & RECEIVING OF RAW MATERIAL

Only properly labelled raw materials are received from reputed suppliers with whom a rate contract is made each year.

All the materials are physically inspected by the Chef / Cook on duty for quality.

Fresh supplies, which include fruits, vegetables, milk and milk products, eggs, are procured on a daily basis.

Provisions and other dry commodities are indented from the main stores on a daily basis.

Substandard materials, if any are rejected at the time of delivery.

STORAGE

Provisions and other dry materials are stored on shelves 6" above the floor at room temperature**,** which are segregated from the processed foods and are stored separately.

First in first out principle is followed for provisions and other dry material.

Milk packets are stored in refrigerator.

FOOD PREPARATION

Pre – preparation and preparation of food shall be carried out in hygienic conditions.

Each meal is freshly prepared and consumed during the mealtime.

Leftover, if any, are discarded within 5 hours.

FOOD DISTRIBUTION

Specified food delivery schedule is followed.

During transportation and service the food is supplied in covered trays for Standard Beds and Critical Care Units and in hot bags for other areas.

Food handlers use apron, caps and gloves while serving the food to the patients.

Based on Consultant's prescription and dietician's advice, patients choose their menu.

20.5.4 Due to risk of food borne illness, family and visitors are not allowed to bring food from outside except in situation permitted by the Consultant.

20.6 CLEANING PROCESS

- Vessels used for food production are cleaned in the pot washing area with soap and hot water.

HYGIENE & SANITATION PRACTICES

Cleaning material and sanitizers are used to maintain high standards of cleanliness.

A cleaning schedule is followed for the cleaning of entire F & B areas as well as the equipment used in the dept.

Food handlers are routinely instructed about food handling techniques and personal hygiene.

Fruits and vegetables intended for raw consumption are washed in 0.1% potassium permanganate solution. The solution shall be changed twice a week or once it becomes turbid.

Food handlers wear gloves while handling food that is ready for consumption.

Hands are washed frequently with soap and water in the designated hand washing areas.

Food handlers cover their head with a cap.

Aprons and uniforms should be neat and tidy.

Eating and drinking are confined to designated areas.

All prepared food shall be covered immediately preferably with aluminium foil.

20.6.10Chopping area shall be clean and chopping boards are scrubbed cleaned with hot water And detergent and sun dried twice a week.

Vegetables and fruits shall be stored in walk in cold room.

Refrigerators used for storing prepared food, chopped vegetables shall be cleaned once a week by the dietary staff.

20.7 SURVEILLANCE OF FOOD HANDLERS

Employees with respiratory infection, intestinal disease, or diarrhoea, jaundice boils, or any skin infection, particularly on the fingers and hands are not allowed to work.

Food handlers are subjected to the following examination periodically

Sl.No	Test	Frequency
1.	General health check up by physician	annually
2	Stool routine / Microscopy for cysts and parasites	Once in 6 months
3	Stool culture for enteric pathogens	Once in 6 months
4	Nail bed cultures /Nasal swab for Staphylococcus aureus	Randomly

20.8 TRAINING FOR FOOD HANDLERS

Food handlers shall be educated on personal cleanliness and hand hygiene as per the training schedule by the infection control nurse.

20.9 HAND WASHING

- Adequate hand washing and hand drying facilities at convenient places has been provided.

20.10 HEALTHY HABITS

- Avoid coughing, sneezing in the vicinity of food, licking fingers before picking up an article of food and smoking on food premises.
- Traffic of unauthorized persons through food preparation area shall also be avoided.

20.11 MINIMUM HANDLING OF FOOD

- Avoid touching food directly with bare hands.
- Use gloves to minimize much contamination.
- Do not touch dirty thing with the glove hand while handling food.

20.12 CLOTHING

- Wear clean designated uniforms.

20.13 REPORTING

- Report any cases of rash, diarrhoea, fever and ill-health to the area supervisor.
- The supervisor should refer such personnel to the employee health physician for further advice and treatment.

20.14 WASTE DISPOSAL

- In food production area food waste and plastic waste are segregated in separate bins with black covers.
- It is cleared once daily by an outsourced agency as per the protocol.

21 LAUNDRY DEPARTMENT

The hospital has laundery services which collect the soiled linen from the hospital and supplies washed and clean linen back to the hospital on a daily basis. Linen contaminated with blood and body fluids from infectious patients are placed in yellow bags, and then sent to the laundry.

21.1 Handling of clean and soiled linen

21.1.1 Definition

- **Soiled Linen** includes all used and/or contaminated linen.
- **Clean Linen** includes all unused and uncontaminated linen.
- **Handling** is the manner in which HOSPITAL personnel should deal with both clean and soiled linen.

21.1.2 Purpose

To prevent gross microbial contamination of air and to protect the staff handling it from potential infection hazards.

Policies

All used linen is considered contaminated and must be bagged before sending to Laundry. It is essential that only used linen is sent to the Laundry and no other items are included in the bags e.g. dentures, instruments, sharp etc.

Clean and soiled linen must be transported separately.

Soiled or infected Linen

Personnel handling and collecting soiled linen should wear heavy-duty gloves and mask.

Only linen used in procedures requiring sterile technique is sterilized in the CSSD.

Soiled linen should be collected and placed in carts designated for soiled linen.

Soiled linen should be handled as little as possible and with minimum agitation to prevent gross microbial contamination of the air and of persons handling the linen.

Handle bags by the neck only.

All soiled and infected linen should be bagged at the location of use in to a yellow bag, and should not be sorted or pre-rinsed in patient care areas. So tag should be attached (number, type of linen) on the bag.

Linen used for patients with MRSA, HIV, Hepatitis B, cholera and linen from the isolation ward in the yellow bag is bagged into yellow covers, labelled as contaminated linen

, tied and sent to laundry.

Bags used to collect and transport soiled linen shall be of sufficient quality to contain wet or soiled linen and prevent leakage during transport.

Hands shall be washed after gloves are removed. Staff shall be instructed in the principles of personal hygiene, including frequent hand washing.

Linen, which is contaminated with blood, excreta or other body fluids or that is otherwise considered to be infected, should be placed in yellow plastic bag,

Disinfection: Done by soaking the linen in 1% Sodium hypochlorite for 30 min followed by washing with detergent and water.

Clean Linen

Hand washing with attention to nails and areas between fingers is mandatory before handling clean linen.

Clean linen should not be handled more than necessary in order to minimize contamination.

Any linen that is dropped should be considered contaminated.

Clean linen should be stored in a clean, dry area.

Storage Awaiting Collection

All linen awaiting collection should be stored in appropriate areas of adequate size and separated from other waste.

They are kept secure from unauthorized persons.

21.1.7 Facilities

21.1.7.1 Hand washing/ hand hygiene facilities shall be available to all employees in the linen area.

Barriers to protect employees from blood and body fluids are located throughout the linen area. The employee should be informed of the location and use of barriers at the time of orientation to the unit.

Carts must be cleaned before transporting clean linen.

Responsibilities

All hospital personnel handling soiled and clean linen should adhere to the established policies and procedures.

Supervisor assesses and assists in meeting the educational needs of his staff, to ensure they are appropriately trained.

Monitor compliance with protective procedures

Infection Control Committee

Assist in providing infection control in-services education.

Monitor compliance with the policies and procedures established in this Manual.

Staff immunization against HBV shall be documented.

Accidental spillage of used linen

In the event of accidental spillage of used linen, carry out the following procedures:

21.1.10.1Wear gloves

Re-bag in appropriate bag

Clean the area with 2 % Sodium hypochlorite with a contact time of 5 min .

Note : If further advice required, contact the Infection Control Team.

22 HOUSE KEEPING DEPARTMENT

House Keeping In Wards

A patient admitted to the hospital can develop infection due to bacteria that survive in the environment. Therefore, it is important to clean the environment thoroughly on a regular basis. This will reduce the bacterial load and make the environment unsuitable for growth of micro-organisms.

The floor is to be cleaned at least two times in 24 hours, morning with Detergent and water solution, and in the evening with 1 % Sodium hypochlorite.

High dusting is to be done with a wet mop once a month.

Fans and lights are cleaned with soap and water once a month.

All work surfaces are to be disinfected by wiping with 1% Sodium hypochlorite with a contact time of 20 min and then cleaned with detergent and water twice a day.

Cupboards, shelves, beds, lockers, IV stands, stools and other fixtures are to be cleaned with detergent and water once a week.

Curtains are to be changed once in 15 days or whenever soiled. These curtains are to be sent for regular laundering. In ICUs once a week.

Patient's cot is to be cleaned every week with detergent and water . 1% sodium hypochlorite to be used when soiled with blood or body fluids. In the isolation ward, cleaning is done daily.

Store rooms are to be mopped once a day and high dusted once a month.

The floor of bathrooms is to be cleaned bleach or phenol.

Toilets are cleaned with a brush using a detergent twice a day (in the morning and evening). Disinfection with bleach . Stain removal using Hydrochloric acid may be used.

Wash basins are to be cleaned with detergent and water solution every morning**.**

22.1.12Regular AC maintenance as per the protocol.

Patient linens

Bed linen is to be changed daily and whenever soiled with blood or body fluids.

Patient's gown is to be changed every day and whenever soiled with blood or body fluids.

Linen used for patients with MRSA, HIV, Hepatitis B, cholera and linen from the isolation room is bagged into yellow cover, labelled as contaminated linen, tied and sent to laundry .

Miscellaneous items

Kidney basins, basins, bed pans, urinals, etc to be rinsed in water and disinfected with 2 % Sodium hypochlorite with a contact time of 5 min and then cleaned with detergent and water.

House Keeping In the Operation Theatre

Theatre complex should be absolutely clean at all items. Dust should not accumulate at any region in the theatre.

Microlyse solution is used for cleaning floors and other surfaces. Operating rooms are cleaned daily and the entire theatre complex is cleaned thoroughly once a week. Use separate mops for each operation rooms & separate mop for corridor.

Before the start of the 1st case

Wipe all equipment, furniture, room, suction points, OT table, surgical light reflectors, other light fittings, slabs etc with 1% Nusept. This should be completed at **least one hour before the start of** surgery.

After each case: The theatre should be cleaned –OT table, and floor. In case of a spill, treat it according to the protocol.

Linen & gloves

Gather all soiled linen and towels in the receptacles provided. Take them to the service corridor (behind the theatre) and place them in trolleys to be taken for sorting. The dirty linen is then sent to the laundry. Use gloves while handling dirty linen.

Instruments

Used instruments are cleaned immediately by the scrub nurse and the attendee.

Instruments are rinsed in water and then washed in the room adjacent to OT by scrubbing with a brush and enzyme solution. They are dried then packed appropriately and sent for sterilization in the CSSD.

After septic cases the instruments are sent in the instrument tray for autoclaving in the flash autoclave/ decontaminate with 1% sodium hypochlorite solution for 20 min. Once

disinfected, they are taken back to the same instrument cleaning area for a manual wash described earlier. They are then packed and sent to CSSD for autoclaving.

Environment

Wipe used equipment, furniture, OR table etc., with 1 % Sodium hypochlorite.

If there is a blood spill, disinfect with 2 % sodium hypochlorite as per the protocol before wiping.

Empty and clean suction bottles and tubing with disinfectant.

After the last case

The same procedures as mentioned above are followed and in addition the following are carried out.

Wipe over head lights, cabinets, waste receptacles, equipment, and furniture with Bacillol 25.
Wash floor and wet mop with liquid soap and then remove water and wet mop with Bacillofloor.
Clean the storage shelves scrub & clean sluice room.

Note: Always clean from more clean to less clean area .Restrict personnel entering after cleaning.

Weekly cleaning procedure

Remove all portable equipment.

22.4.7.2 Damp wipe lights and other fixtures with detergent.

Clean doors, hinges, facings, glass inserts and rinse with a cloth moistened with detergent.

Wipe down walls with clean cloth mop **detergent and water.**

Scrub floor using detergent and water .Use 1% Sodim hypochlorite to mop it finally.

Suction bottles are emptied cleaned and disinfected by immersing in 1% sodium hypochlorite solution for 30 minutes or ETO sterilized.

Transport vehicles including straps and attachments are cleaned with disinfectant.

Stainless steel surfaces – clean with detergent, rinse & clean with warm water.

Wash (clean) and dry all furniture and equipment (OT table, suction holders, foot & sitting stools, Mayo stands, IV poles, basin stands, X-ray view boxes, hamper stands, all tables in the room, holes to oxygen tank, kick buckets and holder, and wall cupboards)

Fumigation done weekly on Saturday or Sunday and before replacement/implant surgeries. Also following infected surgeries.

Maintenance and Repairs

Machinery and equipment should be checked, cleaned and repaired routinely

Urgent repairs should be carried out at the end of the days list

Air conditioners and suction points should be checked, cleaned and repaired on a weekly basis.

Preventive maintenance on all theatre equipment to be carried out weekly and major work to be done at least once every year.

Cleaning after an infected case on Operating Room

Cleaning is same as for other cases.

Replace all the plastic and rubber tubing after surgery.

Change gloves, gown, mask and all other protective equipments immediately.

Keep it inside the OT in an appropriate container for disposal.

HBsAg positive, HCV positive & HIV positive linen should be double bagged in a yellow bag to protect from any leakage.

House Keeping In the Isolation Rooms

Before admission:

The admitting physician should inform the sister in charge of Isolation room at least one hour prior to admission, mentioning the diagnosis, sex and the general state of the patient.

Pre-requisites for Isolation

The mattress and pillows should have an impervious cover such as mackintosh so that it can easily be damp dusted.

Clean gowns should always be available.

Separate urinals, bedpans and thermometers are to be used for each patient.

A bin lined with the appropriate colour coded plastic cover should be available in each room for disposal of medical waste.

Rooms should be isolated according to disease conditions and should be well lit.

22.11 Cleaning procedure for isolation room:

22.11.1 Linen should be stripped from the bed with care taken not to shake the linen during this action.

22.11.2 Linen should be bagged in to yellow cover, labelled as contaminated linen, tied and sent to laundry.

All other articles like IV stands and furniture should be cleaned with detergent and disinfected with 1% sodium hypochlorite solution.

The bathrooms should be disinfected with R6 solution.

At discharge (terminal disinfection):

The pillows and mattress are to be cleaned with detergent, disinfected with 1% sodium hypochlorite and dried in sunlight for 24 hours.

Bed sheets, curtains, gowns and dusters must be removed sent to laundry as infected Lenin for further management.

After disinfection, wash the room, wall, window, doors, bathroom, sink and furniture with soap solution after doing thorough high dusting in that cubicle.

Soak bed pan, urinal, kidney basin in 2% sodium hypochlorite with a contact time of 5 min , wash with detergent and dry.

Bath basins, multi-bin, bucket, jugs, mugs are washed with soap solution and stored dry.

Rubber sheets (mackintosh) are to be cleaned with 1% sodium hypochlorite, dried, powdered and replaced.

Soak the thermometer tray and its contents in 2% sodium hypochlorite after cleaning. Utensils used by the patient are washed, boiled and replaced**.**

23 Occupational exposure to blood and body fluids

INTRODUCTION

Healthcare personnel are at risk for occupational exposure to blood borne pathogens, including Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus (HIV). Exposures occur through needle sticks or cuts from other sharp instruments contaminated with an infected patient's blood or through contact of the eye, nose, mouth, or skin with a patient's blood. Important factors that influence the overall risk for occupational exposures to blood borne pathogens include the number of infected individuals in the patient population and the type and number of blood contacts. Most exposures do not result in infection. Following a specific exposure, the risk of infection may vary with factors such as these:

- The pathogen involved
- The type of exposure
- The amount of blood involved in the exposure
- The amount of virus in the patient's blood at the time of exposure

In our hospital we have in place a system for reporting exposures in order to quickly evaluate the risk of infection, inform about treatments available to help prevent infection, monitor for side effects of treatments, and determine if infection occurs. This may involve testing blood and offering appropriate post exposure treatment.

RISK OF INFECTION AFTER EXPOSURE

- for hepatitis B, 9-40%
- risk for hepatitis C , 1-10%

HBV

Healthcare personnel who have received Hepatitis B vaccine and developed immunity to the virus are at virtually no risk for infection. For a susceptible person, the risk from a single needle stick or cut exposure to HBV-infected blood ranges from 9 - 40 % and depends on the Hepatitis B 'e' antigen (HBeAg) status of the source individual.

HCV

The average risk for infection after a needle stick or a cut following exposure to HCV infected blood is approximately 1-10 %. The risk following a blood exposure to the eye, nose or mouth is unknown, but is believed to be very small. However, HCV infection from blood splash to the eye has been reported.

HIV

The average risk of HIV infection after a needle stick or cut following exposure to HIV-infected blood is 0.3%. The risk after exposure of the eye, nose, or mouth to HIV-infected blood is estimated to be on average, 0.1%. The risk after exposure of non-intact skin to HIV-infected blood is estimated to be less than 0.1%.

MANAGEMENT OF BLOOD & BODY FLUID EXPOSURE

Immediately following an exposure to blood :

Wash needle sticks and cuts with **soap and water**.

Flush splashes to the nose, mouth, or skin with water.

Irrigate eyes with clean water, saline, or sterile irrigants.

Do not use antiseptics, suck or squeeze the wound.

23.3.1.4 If source HIV/HCV and HBsAg status is unknown then send source blood samples for estimation of HCV/HIV and HBsAg.

Exposed health care worker also submits the blood for HBV/HCV/HIV.

If source is negative for HIV/HBV and HCV, the exposed sample should only be tested for HIV.

If source is negative for HIV/HBV/HCV the file should be closed immediately or no further action is required.

If the source is HIV positive then pregnancy status of the health care worker is to be ascertained.

Start post exposure prophylaxis depending on the type of exposure.

Collect the details regarding CD4/CD8 count, viral load and anti retroviral drug use of the source.

Test HIV status of exposed as per NACO guidelines mentioned in the hospital protocol.

If the source is HBV positive, test exposed for HBsAg and anti HBs level. Decide on appropriate prophylaxis. Repeat HBsAg at 3 and 6 months.

Report the exposure to the immediate Supervisor/HOD & Infection control department within 24hrs of exposure. Prompt reporting is essential because, in some cases, post exposure treatment may be recommended and it should be started as soon as possible preferably within 2 hours of exposure , maximum within 2 days.

If exposure occurs on:

- Working days – 9.00 am to 4.00 pm, report to Infection Control nurse who documents the incident, ensures that first aid has been given and reports to the Infection control officer for further action.
- Other times – report to Nursing Supervisor on duty. The Nursing Supervisor shall communicate to the casualty medical officer on duty in the emergency for further advise and action. * While reporting, remember to bring the details of source patient.

Determine risk associated with exposure by

Type of fluid (e.g., blood, visibly bloody fluid, other potentially infectious fluid/tissue)

Type of exposure (i.e., percutaneous injury, mucous membrane or non-intact skin exposure)

Evaluate exposure source

Assess the risk of infection using available information

Test known sources for HBsAg, anti-HCV & HIV antibody (consider rapid testing)

For unknown sources, assess risk of exposure to HBV, HCV or HIV infection

Evaluate the exposed person

Assess immune status for HBV infection

23.3.5 Post-exposure management for HBV

VACCINATION & ANTIBODY RESPONSE STATUS OF EXPOSED WORKERS	STATUS OF THE SOURCE		
	HBSAG POSITIVE	SOURCE HBSAG NEGATIVE	SOURCE UNKNOWN OR NOT AVAILABLE FOR TESTING
Unvaccinated	HBIG x 1 & initiate HBV Vaccine series	Initiate Hepatitis B vaccine series	Initiate Hepatitis B vaccine series
Previously vaccinated	-	-	-
Known responder #	No treatment	No treatment	No treatment
Known nonresponder ##	HBIG x 1 and initiate revaccination or HBIG x 2	No treatment	If known high-risk source, treat as if source were HBsAg +ve
Antibody response unknown	Test exposed person for anti-HBs 1. If adequate*no treatment is necessary. 2. If inadequate**, administer HBIG x 1 and vaccine booster.	No treatment	Test exposed person for anti-HBs 1. If adequate no treatment is necessary. 2. If inadequate, administer vaccine booster and recheck titre in 1-2 months.

- Hepatitis B immunoglobulin; dose is 0.06 mL/kg intramuscularly.
- A responder is a person with adequate levels of serum antibody to HBsAg
- A non-responder is a person with inadequate levels of serum antibody to HBsAg

- The option of giving one dose of HBIG and reinitiating the vaccine series is preferred for non-responders who have not completed a second 3 dose vaccine series. For persons who previously completed a second vaccine series but failed to respond 2 doses of HBIG are preferred.

* Adequate levels of serum antibody to HBsAg (i.e., anti-HBs ≥10mlU/mL)

**Inadequate response to vaccination (i.e., serum anti-HBs <10mlU/mL)

(Source: CDC Guidelines, MMWR Sept 30, 2005/54(RR9); 1-13).

Post-exposure management for HCV

Perform baseline and follow-up testing for anti-HCV and Alanine Amino Transferase (ALT) 4-6 months after exposure.

Perform HCV RNA at 4-6 weeks if earlier diagnosis of HCV infection desired. 23.3.6.3Confirm repeatedly reactive anti-HCV enzyme immunoassays (EIAs) with supplemental tests.

23.3.7 Post-exposure prophylaxis for HIV AS per NACO Guidelines

Note: Occupational exposure to HIV - very low risk

- needle stick injuries
- cuts from other sharps
- contact of eye, nose, mouth or skin with blood

Note : Most exposures do not result in infection

Risk for acquiring HIV infection following occupational exposure :

Small amount of blood on intact skin	No risk
Needle stick injury	1 in 300 (0.3%)
Exposure of eye, nose or mouth	1 in 1000 (0.01%)
Risk with damaged skin	1 in 1000 (0.01%)

Factors affecting transmission

- amount of blood in the exposure
- amount of virus in patient's blood
- whether P.E.P. taken or not

Note: Average risk of HIV infection after an occupational exposure increases if the patient has high viral load as in patients with acute HIV infection or patient near death.

23.3.7.3 Prevention of occupational exposure

- Standard precautions

23.3.7.3.1 Prompt measures:

- Do not Panic
- Do not put cut / pricked Finger into your mouth

Post-HIV exposure management / prophylaxis (PEP)

It is necessary to determine the status of the exposure and the HIV status of the exposure source before starting post-exposure prophylaxis(PEP)

STEP1:MANAGEMENTOFEXPOSURESITE–FIRSTAID

Forskin—iftheskinisbrokenafteraneedle-stickorsharpinstrument:

- Immediatelywash thewound andsurroundingskin with waterand soap,and rinse. Do not scrub.
- Do not use antiseptics or skin washes (bleach, chlorine, alcohol, betadine).

After a splash of blood or body luids:

- To unbroken skin:
  - Wash the area immediately
  - Do not use antiseptics
- For the eye:
  - Irrigate exposed eye immediately with water or normal saline
  - Sit in a chair, tilt head back and ask a colleague to gently pour water or normal saline over the eye.
  - If wearing contact lens, leave them in place while irrigating, as they form a barrier over the eye and will help protect it. Once the eye is cleaned, remove the contact lens and clean them in the normal manner. This will make them safe to wear again
  - Do not use soap or disinfectant on the eye.
- For mouth:
  - Spit fluid out immediately
  - Rinse the mouth thoroughly, using water or saline and spit again. Repeat this process several times
  - Do not use soap or disinfectant in the mouth

Consult the designated physician of the institution for management of the exposure immediately.

Table49:Summaryofdo'sanddon't

Do	Do Not
Remove gloves, if appropriate	Do not panic

Wash the exposed site thoroughly with running water	Do not put the pricked finger in mouth
Irrigate with water or saline if eyes or mouth have been exposed	Do not squeeze the wound to bleed it
Wash the skin with soap and water	Do not use bleach, chlorine, alcohol, betadine, iodine or other antiseptics/detergents on the
** Do - Consult the designated physician immediately as per institutional guidelines for management of the occupational exposure **	

STEP 2: ESTABLISH ELIGIBILITY FOR PEP

The HIV sero-conversion rate of 0.3% after an AEB (for percutaneous exposure) is an average rate. The real risk of transmission depends on the amount of HIV transmitted (= amount of contaminated fluid and the viral load).

A designated person/trained doctor must assess the risk of HIV and HBV transmission following an AEB. This evaluation must be made rapidly, so as to start any treatment as soon as possible after the accident (Ideally within 2 hours but certainly within 72 hours). This assessment must be made thoroughly (because not every AEB requires prophylactic treatment).

The first dose of PEP should be administered within the first 72 hours of exposure and the risk evaluated as soon as possible. If the risk is insignificant, PEP could be discontinued, if already commenced.

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

Two main factors determine the risk of infection: the nature of exposure and the status of the source patient.

Assessing the nature of exposure and risk of transmission

Three categories of exposure can be described based on the amount of blood/fluid involved and the entry port. These categories are intended to help in assessing the severity of the exposure but may not cover all possibilities.

Table 50: Categories of exposure

Category	Definition and example
Mildexposure:	mucous membrane/non-intact skin with small volumes E.g. : a superficial wound (erosion of the epidermis) with a plain or low calibre needle, or contact with the eyes or mucous membranes, subcutaneous injections following small-bore
Moderate exposure:	mucous membrane/non intact skin with large volumes OR percutaneous superficial exposure with solid needle E.g. : a cut or needle stick injury penetrating gloves
Severe exposure :	percutaneous with large volume e.g. : • an accident with a high calibre needle (≥18 G) visibly contaminated with blood; • a deep wound (haemorrhagic wound and/or very painful); • transmission of a significant volume of blood;

The wearing of gloves during any of these accidents constitutes a protective factor.
Note: In case of an AEB with material such as discarded sharps/needles, contaminated for over 48 hours, the risk of infection becomes negligible for HIV, but still remains significant for HBV. HBV survives longer than HIV outside the body.

Assessing the HIV status of the source of exposure

PEP needs to be started as soon as possible after the exposure and within 72 hours. In animal studies, initiating PEP within 12, 24 or 36 hours of exposure was more effective than initiating PEP 48 hours or 72 hours following exposure. PEP is not effective when given more than 72 hours after exposure. A baseline rapidHIVtesting shouldbedonebeforestartingPEP.

Initiation of PEP where indicated should not be delayed while waiting for the results of HIV testing of the source of exposure. Informed consent should be obtained before testing of the source as per national HIV testing guidelines

Table51: Categoriesofsituationsdependingonresultsofthesource	
Source HIV Status	Definitionofriskinsource
HIV negative	Source is not HIV infected but consider HBV and HCV
Lowrisk	HIV positive and clinically asymptomatic
High risk	HIV positive and clinically symptomatic (see WHO clinical staging)
Unknown	Status of the patient is unknown, and neither the patient nor his/her blood is available for testing (e.g. injury during medical waste management the source patient might be unknown). The risk assessment will be based only upon the exposure (HIV prevalence in the locality can be considered)
Refer to annex 15: Risk assessment for the source person	

HIV infection is not detected during the primary infection period by routine-use HIV tests. During the "window period",which lasts for approximately6 weeks, the antibody level is still too low for detection – but infected persons can still have a high viral load. This implies that a positive HIV test result can help in taking the decision to start PEP, but a negative test result does not exclude HIV infection. In districts or some population groups with a high HIV prevalence, a higher proportion of HIV-infected individuals are found in the window period. In these situations, a negative result has even less value for decision-making on PEP.

Assessment of the exposed individual

The exposed individual should have confidential counselling and assessment by an experience physician. Theexposedindividual should beassessed for pre-existingHIV infection(*see Step 5*) intendedfor people who are HIV negative at the time of their potential exposure to HIV. Exposed individuals who are known or discovered to be HIV positive should not receive PEP. They should be offered counselling and information on prevention of transmission and referred to clinical and laboratory assessment to determine eligibility for antiretroviral therapy (ART). Besides the medical assessment,

counselling(*seeStep3*)exposedHCPis essentialtoallayfearandstartPEP(ifrequired) at the earliest.

STEP 3: COUNSELING FOR PEP

Exposed persons(clients) should receive appropriate information about what PEP is aboutand the risk and benefits of PEP in order to provide informed consent. It should be clear that PEP is not mandatory.

Table52:Keyinformationtoprovideinformedconsentto the client after occupational exposure

Keyinformationto exposedperson(client)	Specific Details include
• The risk of acquiring HIV infection from the specific exposure	• Ask client for understanding of HIV transmission risk after exposure • The risk of getting HIV infection from a person known to be HIV positive is estimated to be - Sharps injury: 3 in 1000 exposures (0.3%) - Mucous membrane splash: 1 in 1000 exposures (0.1%) - the risk in increased with large exposure eg needle- stick from hollow bore needles with visible blood, from artery or vein and from source patients with high viral load (usually very -
• What is known about PEP efficacy	• Ask client's understanding of PEP • PEP is provided to prevent potential transmission of the HIV virus • PEP is not 100% effective and should be given within 72 hours (ideally as soon as possible, if eligible). • Balance risk and benefits of PEP: PEP *may* prevent HIV transmission, versus possible risk of side effects

Table52: Key information to provide informed consent to the client after occupational exposure	
• Information about client's risk of HIV infection based upon a risk assessment (if s/he has not had a recent HIV test) • The importance of being tested and receiving appropriate post-test counselling (although HIV testing can be delayed if needed) • That PEP medicines will be discontinued if their initial (baseline) HIV test is positive	• Client's possibility of prior HIV infection should be assessed • Counsel for HIV testing and follow-up psychosocial support – where possible rapid testing should be used based on national testing guidelines • Inform if the baseline HIV test is positive, then the PEP will be discontinued • Arrange referral to ART centers for assessment if found HIV positive
• Importance of adhering to medication once started • Duration of the course of medicine (4 weeks)	• Discuss dosing of the PEP medicine eg pill should be taken twice a day for 28 days, once in the morning and once in the evening • Depending on the nature and risk of exposure, 2 drugs or 3 drugs may be used • Side effects may be important with use of 3 drugs • Expert opinion/consultation by phone or referral may be needed with a HIV
• Common side effects that may be experienced	• Discuss possible side effects of the PEP medicines eg. nausea, fatigue, headache (depending on which drugs given) • Side effects often improve over time. It is often minor and do not need specialised supervision
• That they can stop at any time but will not get the benefit of PEP – if the source is HIV positive	• Animal studies suggest that taking less than 4 weeks of PEP does not work • If client decides to stop at any time, s/he needs to contact the physician before stopping the medications • Arrange for follow-up visit and decide

• Prevention during the PEP period eg sexual intercourse and unplanned pregnancy	• After any AEB, the exposed person should not have unprotected sexual intercourse until it is confirmed, 3 months after the exposure, that s/he is not HIV infected.
• If client is pregnant – she can still take PEP during pregnancy	• The PEP drugs used are safe for pregnancy • If the client gets HIV during the pregnancy due to the exposure, the baby will have some risk of becoming HIV
• Safety of PEP if the client is breastfeeding	• The PEP drugs used are safe during breast-feeding
• Educate client on the possible signs and symptoms of early HIV sero-conversion	• Signs and symptoms of early HIV sero-conversation: fever, rash, oral ulcers, pharyngitis, malaise, fatigue, joint pains, weight
• Risk of acquiring Hepatitis B and C from a specific exposure and availability of prophylaxis for this	• Risk of Hepatitis B is 9–30% from a needle stick exposure – the client can be given vaccinations • Risk of Hepatitis is 1–10% after needle
Note: Provider should correct misconceptions at all times during the counselling sessions	

Psychologicalsupport: Many people will feel anxious after exposure. Every exposed person needs to be informedabout therisks and the measures that can be taken. This will helptorelievepartoftheanxiety, but some may require further specialised psychological support.

Documentationonrecordis essential. Specialleavefromworkshould beconsideredfora periodoftime eg. 2 weeks (initially) then, as required based on assessment of the exposed person's mental state, side effectsandrequirements.

Practical application in the clinical settings:

- Once prophylactic treatment has begun, the exposed personmust sign form.
- Informedconsent also meansthat if the exposed personhas been advised PEP, but refusestostart it, s/he should sign Form . This document should be kept by the designated officer for PEP.
- An information sheet covering the PEP a n d t h e biological follow-up after any AEB (*see Annex 13, p 121*) may be given to the person under

treatment. However, this sheet cannot replace verbal explanations.

- Arrangefor follow-up visitandleave fromwork.

STEP4:PRESCRIBE PEP

Deciding on PEP regimen

Tab Tenofovir 300 mg /day , Tab Lamivudine 300 mg/day and Tab Efavirez 300 mg/day.

The decision to initiate the type of regimen depends on the type of exposure and HIV serostatus of the source person. *See Table 53*.

Table 53: HIV Post-exposure Prophylaxis evaluation

Exposure	Statusofsource		
	HIV+ and asymptomatic	HIV+ and Clinically symptomatic	HIV status unknown
mild	Consider 2-drug	Start 2- drug PEP	Usually no PEP or consider 3drug PEP
moderate	Start 2-drug PEP	Start 3-drug PEP	Usually no PEP or consider 3-drug PEP
severe	Start 3-drug PEP	Start 3-drug PEP	Usually no PEP or consider 3-drug PEP

- HIV testing of the source patient should not delay the decision about whether or not to start PEP. Start 2-drugs first if required, then send for consultation or refer.
- In the case of a high risk exposure from a source patient who has been exposed to or is taking antiretroviral medications, consult an expert to choose the PEP regimen, as the risk of drug resistance is high. Refer/consult expert physician. Start PEP.

Expert opinion may be obtained for the following situations

(Refer to list of HIV/PEP experts on www.nacoonline.org)

- Delayinreportingexposure(>72hours).
- Unknown source: useof

PEP tobe decidedoncase tocase basis afterconsideringthe severity ofexposure andthe epidemiologiclikelihoodofHIVtransmission.Do not delayPEPinitiationifindicated.

- Known or suspected pregnancy: do not delay PEP if indicated.
- Breastfeeding issues in the exposed person: do not delay PEP if indicated. Consider stopping breast feeding if PEP is indicated.
- Source patient is on ART or possibly has HIV drug resistance: refer/consult as soon as possible.
- Major toxicity of PEP regimen:minor side effectsmaybemanaged symptomatically.Refer toexpert if non-tolerance or non-adherence.
- Refer/consult if in doubt or complicatedcases(eg major psychological problem).

Various animal studies done over the years have provided encouraging evidence of post exposure chemoprophylactic efficacy. Studies have also shown that delaying initiation, shortening the duration or decreasing the antiretroviral dose of PEP, individually or in combination, decreased its prophylactic efficacy.Inaretrospective casecontrolstudyofHCP,itwasdemonstratedthatuseofZidovudineasPEPwas associated with a reduction in the risk of HIV infection by approximately 81%. Also the experience in HIV infected patients has shown that combination of different antiretroviral agents is superior to monotherapy regimen, so a combination of two or three drugs in PEP regimen should be more beneficial than a single drug.Oneneedstoconsidertoxicityofa combinationregimenvis-à-visriskoftransmission.

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

Initiate hivchemoprophylaxis

Because post-exposure prophylaxis (PEP) has its greatest effect if begun within 2 hours of exposure, it is essential to act immediately.There islittle benefit if >72hourslater. The prophylaxisneedstobecontinuedfor4weeks.

- Reportexposureimmediatelytoappropriateauthority.
- Fill in the medical form.
- Never delay start of therapy due to debate over regimen. Begin with basic 2-drug regimen, and once expert advice is obtained, change as required.

- The 3rd drug can be added after consultation with an expert.

Tenofovir	300 mg/ day
Lamivudine (3TC)	300 mg / day
Efavirez	300 mg / day

Duration of PEP:

PEP should be started, as early as possible, after an exposure. It has been seen that PEP started after 72 hours of exposure is of no use and hence is not recommended. The optimal course of PEP is not unknown, but 4 weeks of drug therapy appears to provide protection against HIV. If the HIV test is found to be positive at any time within 12 weeks, the HCW should be referred to a physician for treatment.

Antiretroviral drugs during pregnancy

If the exposed person is pregnant, the evaluation of risk of infection and needforPEPshould be approached aswith anyother person who has had an HIVexposure.However,the decision to use anyantiretroviraldrug during pregnancy should involve discussion between the woman and her health-care provider (s) regarding the potential benefits and risks to her and her foetus.

Data regarding the potential effects of antiretroviral drugs on the developing foetus or neonate are limited. Thereisaclearcontraindicationfor Efavirenz(first3monthsofpregnancy)and Indinavir (prenatal).

In conclusion, for a female HCP considering PEP, a pregnancy test is recommended if there is any chance thatshemaybepregnant.PregnantHCParerecommendedtobeginthebasic2-drugregimen, andifathird drug is needed, Nelinavir is the drug of choice.

Side-effects and adherence to PEP

Studies of HCP taking PEP have reported more side effects than PLHA staking ART, most commonly nausea and fatigue. Possible side-effects occur mainly at the beginning of the treatment and include nausea, diarrhoea, muscular pain and headache. The person taking the treatment should be informed that these may occur and should be dissuaded from stopping the treatment as most side-effects are mild and transient, though possibly uncomfortable. Anaemia and/or leucopenia and/or thrombocytopenia may occur during the month of treatment. A complete blood count and liver function tests(transaminases)maybe performed at the beginning of treatment(as baseline)and after 4weeks.

In practice and from HCP studies, many HCP did not complete the full course of PEP because of side effects. Side effects can be reduced by prescribing regimens that do not include a protease inhibitor (PI), by giving medications to reduce nausea and gastritis and by educating clients about how to reduce side effects eg. Taking PEP medications with food. It is important that side effects should be explained before initiating PEP so that the symptoms are not confused with symptoms of sero conversion to HIV.

Adherence information is essential with psychological support. More than 95% adherence is important in order to maximise the efficacy of the medication in PEP.

Step 5: Laboratory Evaluation

The reason for HIV testing soon after an occupational exposure is to establish a "baseline" against which to compare future test results. If the HCP is HIV-negative at the baseline test, it is in principle possible to prove that subsequent infection identified by follow-up testing is related to the occupational exposure (depending on the timing of infection and consideration of other risks or exposures). When offered HIV testing, the exposed person should receive standard pre-test counseling according to the national HIV testing and counseling guidelines, and should give informed consent for testing. Confidentiality of the test result must be ensured.

There are different reasons for possibly delaying HIV testing: the HCP may be unable to give informed consent immediately after the exposure due to anxiety, the exposure occurs outside working hours or in settings where HIV testing is not readily available. The HIV test may be done up to several days after the exposure, based on informed consent and with pre- and post-test counseling and ensuring confidentiality.

Do not delay PEP if HIV testing is not available.

Table 58: Recommended baseline laboratory evaluation

Timing	In persons taking PEP (standard regimen)	In persons not taking PEP
Baseline (within 8 days after AEB)	HIV, HCV, anti-HBs* Complete blood count Transaminases	HIV, HCV, anti-HBs *

* *HIV, HBV and HCV testing of exposed staff within 8 days of an AEB is required (baseline serostatus).* ***Offer an HIV test in case of an AEB, as a positive HIV status may indicate the need to discontinue PEP****. The decision on whether to test for HIV or not should be based on informed consent of the exposed person.*

HIV RNA testing by polymerase chain reaction (PCR) during PEP has a very poor positive predictive value and should be strongly discouraged.

Pregnancy testing should also be available, but its unavailability should not prevent the provision of PEP.

Other laboratory testing such as haemoglobin estimation should be available, especially when AZT is used for PEP in areas where anaemia is common.

Testing for other blood-borne diseases such as syphilis, malaria and kala-azar may also be useful, depending on the nature of risk, symptoms of the source patient, local prevalence and laboratory capacity.

Step 6: Follow-up of an Exposed person

Whether or not PEP prophylaxis has been started, follow up is indicated to monitor for possible infections and provide psychological support.

Clinical follow-up

In addition, in the weeks following an AEB, the exposed person must be monitored for the eventual appearance of signs indicating an HIV seroconversion: acute fever, generalised lymphadenopathy, cutaneous eruption, pharyngitis, non-specific lu symptoms and ulcers of the mouth or genital area. These symptoms appear in 50%-70% of individuals with an HIV primary (acute) infection and almost always within 3 to 6 weeks after exposure. When a primary (acute) infection is suspected, referral to an ART centreorforexpert opinionshouldbearrangedrapidly.

An exposedpersonshouldbeadvisedto use precautions(e.g., avoid blood or tissue donations, breast feeding,unprotected sexual relations or pregnancy) to prevent secondary transmission, especially during the first 6–12 weeks following exposure. Condom use is essential.

Adherence and side effect counselling should be provided and reinforced at every follow-up visit. Psychological support and mental health counselling is often required.

6 *Laboratory follow-up*

Follow-up HIV testing: exposed persons should have post-PEP HIV tests. Testing at the completion of PEP may give an initial indication of seroconversion outcome if the available antibody test is very sensitive. However, testing at 4–6 weeks may not be enough as *use of PEP may prolong the time to seroconversion;* and there is not enough time to diagnose all persons who seroconvert. Therefore, **testing at 3 months and again at 6 months is recommended.** Very few cases of seroconversion after 6 months has been reported. Hence, no further testing is recommended if the HIV test at 6 months is negative.

Table 59: Recommended follow-up laboratory tests		
Timing	**In persons taking PEP (standard**	**In persons not taking PEP**
Weeks 2 and 4	Transaminases* Complete blood	Clinical monitoring for hepatitis
Week 6	HIV-Ab	HIV-Ab
Month 3	HIV-Ab, anti-HCV, HBsAg	HIV-Ab, anti-HCV, HBsAg
Month 6	HIV-Ab, anti-HCV, HBsAg Transaminases*	HIV-Ab, anti-HCV, HBsAg

* *Transaminases should be checked at week 2 and 4 to detect hepatitis in case the exposed person contracted HBV from the AEB.*

§ *For persons started on AZT-containing PEP regimens*

7 PEP Starter Kit:: PEP Starter kit (Containing 3 drugs for 10 days) containing Tenofovir 300mg ,Lamivudine 300mg and Efavirez 300 mg is readily available in emergency department.

8 ART Centre:

Some cases if necessary will be referred to nearby ART center given below

1) Victoria Hospital, City market, Bangalore-560002. Ph no- 080-26701150
2) St John Hospital, Sarjapur road, Bangalore-560034. Ph no- 080-49466029

24 Outbreak Handling

Definition:

An increase in the isolation rate of an organism or clustering of clinical cases in the same time frame suggests an outbreak.

Factors suggesting an outbreak:

- Lab report of a bacteriology specimen grows an alerting organism.
- Two or more patients are found to have an infection attributed to a species not previously documented, particularly if it has occurred after a surgical procedure.
- The clinicians or the ward staff reports multiple infections of similar nature.

Managing an Outbreak

Confirm the existence of an outbreak. An outbreak is an infection control emergency; measures should be taken as soon as outbreak is suspected.

Recognition of an outbreak

Preliminary Investigation: Develop a case definition, which includes site, pathogen and affected population.

Verify diagnosis: By reviewing each case with the definition.

Determine the magnitude of the problem: Number of cases and the severity.

Confirm that an outbreak exists: By comparing the present rate with endemic rate.

Take immediate relevant control measures:

Study the available information to identify relevant control measures.

Review and strengthen the relevant infection control practices e.g. hand washing, isolation, environmental cleaning, aseptic procedures, disinfection and sterilization.

Restrict visitors.

Screen personnel and environment as indicated

Determine who is at risk of becoming ill , look at the changes that may have affected the rate of infection eg, new staff , new procedure , new lab tests , and HCW : patient ratio etc.,

Write a coherent report [prelimnary and final]

NOTIFICATION

Notify the Infection Control Committee, hospital administration, relevant departments and epidemiological unit. Educate the staff, patients and visitors.

Outbreak Control Committee: ICT may consider forming an Outbreak Control Committee depending on the nature and magnitude of the outbreak.

This committee should,

Meet regularly until the outbreak is under control.

Major decisions such as ward closure should be taken by this committee.

Designate a person to work with media if necessary.

Active case Finding; Search for the additional cases by using clinical and microbiological records.

Microbiological Investigations: Microbiological investigations should be done depending upon the suspected epidemiology of the causative organism. Consult the microbiologist or obtain off-site microbiologist's opinion to decide on appropriate specimens.

Epidemiological Typing: Typing of the etiological agent could be done depending on the facilities available.

Line listing.

Prepare a data collection tool, e.g. Questionnaire.

Record all the cases noting patient details, date and time of onset of symptoms in each case, date of admission, place infection details etc.

Data Analysis: Analyse the data to identify common features of the cases. E.g. age, exposure to risk factors.

Formulating and testing hypotheses: Formulate a hypothesis about suspected causes for the outbreak based on literature survey and common features of cases.

Hypothesis is tested by a case control study, or microbiological study to delineate the problem and identify the source.

Case control study – a group of uninfected patients (control group) is compared with infected patients (case group).

Microbiological study – planned according to the known epidemiology of infection problem. This identifies possible sources and routes of transmission.

Control Measures

Strengthen specific control measures as soon as the cause of outbreak is identified.

These may include,

Identification and elimination of the contaminated product.

Modification of nursing procedures.

Identification and treatment of carriers.

Correction of lapses in technique or procedure.

Monitor:

24.6.2.5.1 Continue follow up of cases after the outbreak clinically as well as microbiologically.

24.6.3 Evaluate: Evaluate for the effectiveness of control measures. Cases should cease to occur or return to the endemic level.

Document the Outbreak :

Prepare a report on the investigation and management of the outbreak and present to the infection control committee, departments involved and the administration

Implement long term infection control for prevention of similar outbreaks.

25 OUTCOME MONITORING

25.1 Monitoring Of Hospital Associated Infections

The ICT monitors the following rates (incidence rates)

- Crude infection rates
- Hospital acquired infection rate
- Catheter associated urinary tract infections
- Hospital acquired respiratory tract infections [HACP , VAP]
- surgical site infections
- intra vascular device associated infections
- Dialysis incidents

Crude infection rate = $\frac{\text{No of culture positive X 100}}{\text{No of Separations}}$

SSI Rate = $\frac{\text{No of surgical site culture positive} \times 100}{\text{Total no of surgeries performed}}$

CRBSI Rate = $\frac{\text{No of blood stream culture positive} \times 1000}{\text{No. of Catheter related bed days}}$

VAP Rate = $\frac{\text{No of ET tube suction culture positive x 1000}}{\text{No. of Ventilator bed days}}$

UTI Rate = $\frac{\text{No of catheter tip culture positive x 1000}}{\text{No. of Catheter bed days}}$

Dialysis incident = $\frac{\text{Dialysis events x 100}}{\text{Patient censes}}$

25.1.6 Bed sore rate = No of patients who develop new / worsening of

$$\frac{\text{Pressure ulcer in a given month}}{\text{No of separations in that month}} \times 100$$

25.1.7 Incidence of phlebitis = $\frac{\text{No of phlebitis cases in a given month}}{\text{Total number of IV cannulation in that month}} \times 100$

The analysed data is circulated to all the clinicians every quarterly by e- mail and or a circular.

26 APPROVED ANTISEPTICS, DISINFECTANTS AND INSTRUMENT CLEANERS

. General. The following antiseptic and disinfectant agents are approved by the Infection Control Committee for use at hospital. These antiseptics and disinfectants may be used only for the purposes specified. Any other antiseptics or disinfectants proposed for use must be submitted to Infection Control Committee for approval prior to their purchase.

. Antiseptics - For use on skin and mucous membranes only.

Hand hygiene

- **Bactorub :**

Chlorhexidine gluconate, 2.5% v/v IP solution equivalent to 0.5% w/v Chorhexidine gluconate 70%Ethanol
Skin Emolients, perfume , Fast green FCF as colour

- **Skin site preparation(CVC/Peripheral IV insertion)**

Microshield tincture: 2.5% v/v IP solution equivalent to 0.5% w/v Chorhexidine gluconate and 70% Ethanol

➢ Skin Preparation

Chlorhexidine gluconate, 4% (Bactoscrub)
Iodophor (povidone-iodine scrub or solution)
Tincture of iodine, 1-2%
Isopropyl alcohol, 70%

Disinfectants - For use on inanimate objects or surfaces.

High Level Disinfection - Used for scopes or instruments that will come into contact with mucous membranes, but will not enter tissue or vascular system. Consult with Infection Control Service regarding use of high level disinfectants.

- **2% glutaraldehyde (Cidex)** : Contact time of 10 min at 20^0C and for 100% killing of Mycobacterium tuberculosis for 45 minute contact time at 25^0C.[1]
- **0.55% Ortho-phthalaldehyde (OPA) :**

Contains 0.55% 1,2-benzenedicarboxaldehyde (OPA).

OPA solution is a clear, pale-blue liquid with a pH of 7.5. solution for a minimum of 5 min at 20^0 C or higher to destroy all pathogenic organisms including Mycobacterium bovis , Pseudomonas aeruginosa , pathogenic fungi and viruses.

Intermediate Level Disinfection - Used for items or surfaces that will not touch mucous membranes, but will contact intact skin.

2.1 Ethyl or Isopropyl alcohol (70%-90%)

3. **Low Level Disinfection** : Used for environmental cleaning and housekeeping.

3.1 1% Sodium hypochlorite : for all horizontal surfaces and floor mopping.

Bacillofloor : For floor mopping inside the OT

2% Sodium hypochlorite : For sharps container and blood and body fluid spillage .

3.3 Bacillol 25 : For disinfecting electronic equipments / 70% Alcohol for electronic surfaces .

Composition:100 gms contains ,

Ethanol – 10 gms

2- Propranolol – 9 gms

1- Propranolol – 6 gms

Baccishield : 20% For fumigation of OT and 10% for surface cleaning/floor mopping .

Composition: Complex formulation of stabilized Hydrogen peroxide 11% w/v with 0.01% Dilute.Silver nitrate solution

Further Instructions on Disinfectants.

Always dilute disinfectants according to manufacturer's instructions printed on the label and document on bottle how long it can be used once diluted. (Note: Some disinfectants must be mixed where an eye wash station is present).

Aerosol or solid room deodorizers may be used for odour control.

Ethyl or isopropyl alcohol should never be used solely for cleaning. Alcohol contains no cleaning properties. It should be followed after cleaning surface with mild detergents.

Never mix chemicals together.

3.6 Blood and Body Fluid Spills :

As per the hospital protocol.

27 References:

1. Practical guidelines for infection control in health care facilities- World Health Organisation-2003
2. Antiretroviral Therapy guidelines for HIV infected adults & adolescent includind post exposure prophylaxis- NACO-2007
3. JOURTNAL OF CLINICAL MICROBIOLOGY, Nov. 1993, p. 2988-2995 Vol. 31, No. 11 0095-1137/93/112988-08-1993
4. American Society for Microbiology
5. Bactericidal, Virucidal, and Mycobactericidal Activities of Reused Alkaline Glutaraldehyde in an Endoscopy Unit JOHN N. MBITHI,' V. SUSAN SPRINGTHORPE,1 SYED A. SAITAR,l* AND MICHELLE PACQUET1TE2
6. Department ofMicrobiology and Immunology, Faculty of Medicine, University of Ottawa,Ottawa, Ontario, Canada K1H 8M5,1 and The Endoscopy Unit, Ottawa General Hospital, Ottawa, Ontario, Canada KJH 8L62 Received 10 May 1993/Returned for modification 26 July 1993/Accepted 16 August 1993

ANNEXURES

Annexure 1

FORMAT FOR NOTIFYING COMMUNICABLE DISEASE

Please use the following format for notifying communicable diseases

Intimation of Notifiable Disease

Patient Name

UHID No.

Age

Sex

Fathers Name

Address

Date of Admission

Date of Discharge

Clinical Diagnosis

Consultant Name

CC To:

DHO

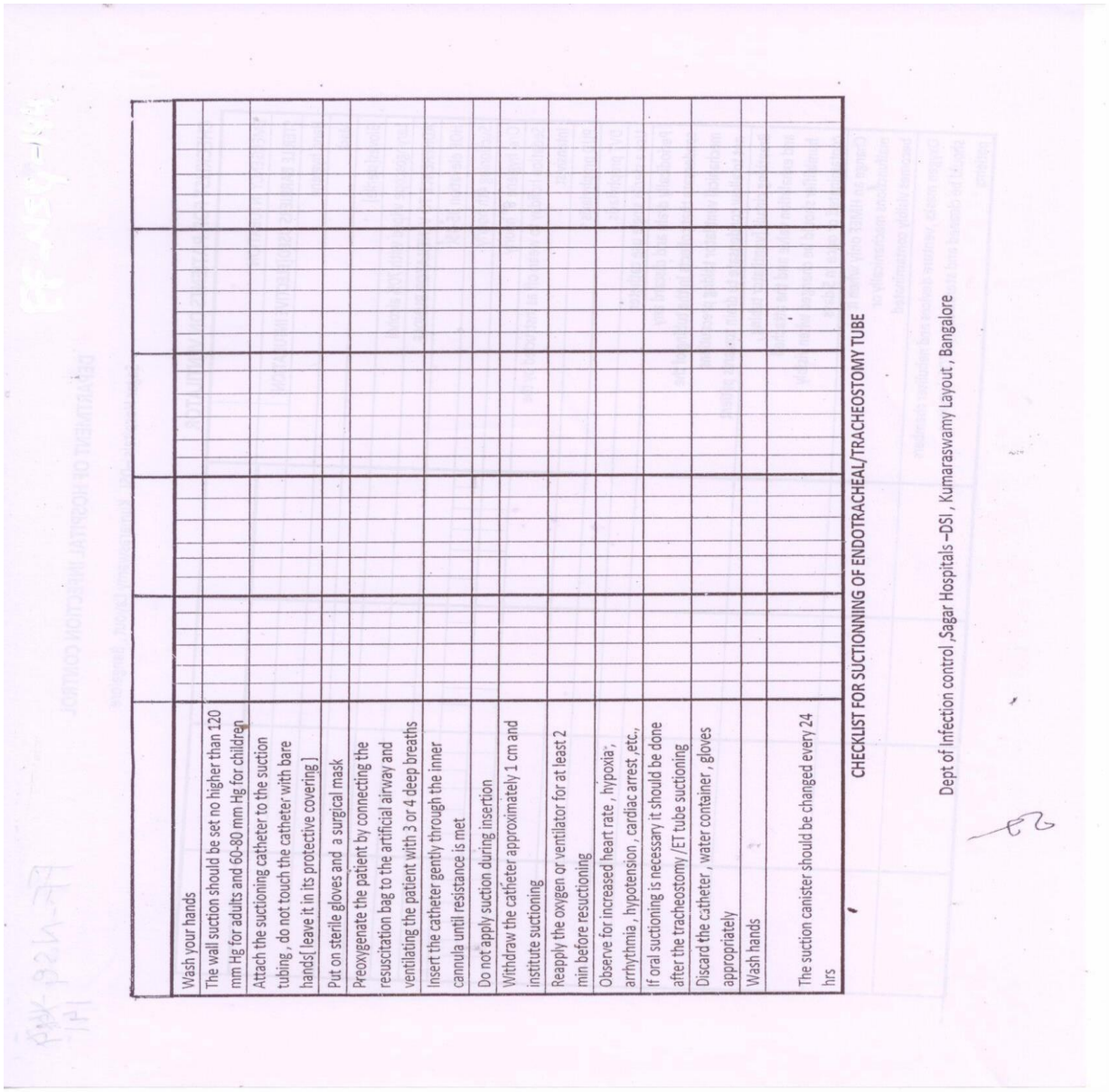
Directorate of Health and Family Welfare Services

Bangalore

To notify immediately by phone or fax and followed by written report on prescribed form.

ANNEXURE 2: VAP CARE BUNDLE

ANNEXURE 3 CHECK LIST FOR INFECTION PREVENTION PRACTICES DURING SUCTIONING



CHECKLIST FOR SUCTIONNING OF ENDOTRACHEAL/TRACHEOSTOMY TUBE

Dept of Infection control ,Sagar Hospitals –DSI , Kumaraswamy Layout , Bangalore

Wash your hands						
The wall suction should be set no higher than 120 mm Hg for adults and 60-80 mm Hg for children						
Attach the suctioning catheter to the suction tubing , do not touch the catheter with bare hands[leave it in its protective covering]						
Put on sterile gloves and a surgical mask						
Preoxygenate the patient by connecting the resuscitation bag to the artificial airway and ventilating the patient with 3 or 4 deep breaths						
Insert the catheter gently through the inner cannula until resistance is met						
Do not apply suction during insertion						
Withdraw the catheter approximately 1 cm and institute suctioning						
Reapply the oxygen or ventilator for at least 2 min before resuctioning						
Observe for increased heart rate , hypoxia , arrhythmia , hypotension , cardiac arrest ,etc.,						
If oral suctioning is necessary it should be done after the tracheostomy /ET tube suctioning						
Discard the catheter , water container , gloves appropriately						
Wash hands						
The suction canister should be changed every 24 hrs						

ANNEXURE 4: CVC CARE BUNDLES

CVC INSERTION CARE BUNDLE :

Bundle to be Followed:	Yes(Y)/No(N)		
	DATE:		
Use single lumen unless indicated otherwise			
Use maximal sterile barrier precautions during insertion (PPE: sterile gloves, sterile apron, cap and mask)			
Avoid femoral site, subclavian vein is the preferred site			
Disinfect skin with 2% chlorhexidine gluconate in 70% isopropyl alcohol and allow it to dry			
Use a sterile, semipermeable, transparent dressing to allow observation of insertion site			
Record date & time of insertion on transparent dressing and nurses record			

CVC MAINTENANCE CARE BUNDLE

Bundle to be Followed:	Yes(Y)/No(N)	
	DATE:	
Review need for CVC on daily basis Remove(R)/ Continue(C)		
Inspect CVC on daily basis for sign of infection		
Use aseptic technique for daily care(Hand hygiene before accessing the device and disinfect catheter hub)		
Dressing		
Replace cannula immediately after administration of blood/blood products and 48 hours after other fluids		

ANNEXURE 5

CARE BUNDLE TO PREVENT SURGICAL SITE INFECTION:

1. Appropriate use of antibiotic :
2. Appropriate removal of hair :
3. Postoperative glucose control (major cardiac patient) :
4. Postoperative normothermia (colorectal surgery patient) :

ANNEXURE 6: PVC INSERTION CARE BUNDLE

Bundle to be Followed:	**Yes(Y)/No(N)** **DATE:**		
PVC is indicated for this patient			
Insert IV catheter using strict aseptic technique and use sterile items			
Disinfect skin with 2% chlorhexidine gluconate in 70% isopropyl alcohol and allow it to dry			
Use a sterile, semipermeable, transparent dressing to allow observation of insertion site			
Record date & time of insertion on transparent dressing and nurses record			

PVC MAINTENANCE CARE BUNDLE

Bundle to be Followed:	**Yes(Y)/No(N)**		
	DATE:		
Review need for CVC on daily basis Remove(R)/ Continue(C)			
Inspect CVC on daily basis for sign of infection			
Use aseptic technique for daily care(Hand hygiene before accessing the device and disinfect catheter hub)			
Dressing			
Replace cannula immediately after administration of blood/blood products and 48 hours after other fluids			

ANNEXURE 7: FOLEY'S CATHETER INSERTION BUNDLE

Bundle to be Followed:	**Yes(Y)/No(N)**		
	DATE:		
Reason for urinary catheter insertion			
Use sterile items/equipments			
Insert catheter using strict aseptic non touch technique			
Use closed drainage system			
Choose catheter of appropriate size			

FOLEY'S CATHETER MAINTAINANCE BUNDLE

Bundle to be Followed:	**Yes(Y)/No(N)**	
DATE:		
Patient name		
Review need for urinary catheter on daily basis Remove(R)/ Continue(C)		
Use aseptic technique for daily care(Hand hygiene, sterile items/equipment's)		
Daily meatal hygiene with soap & water		
Don't break the closed drainage system. If urine specimen required take specimen aseptically via sampling port		
Keep the drainage bag above floor but below bladder level.		
urine bag is to be emptied once it is 2/3rd full / when indicated		

ANNEXURE 8: ENVIRONMENTAL CONTROL OF HIGH RISK AREAS

a) INTENSIVE CARE UNIT

Background

The ICU is highly specified and sophisticated area of the hospital which is specifically designed, staffed, located, furnished and equipped, dedicated to management of critically ill patients, injuries or complications. This is considered a high risk area of the health care set-up as it is prone to have a high rate of different health care associated infections. Therefore there are certain recommendations, required to follow when planning for ICU construction.

Bed space (Unit size 6-12 beds)

- Single bed space-minimum 100 sq ft (Desirable >125)
- Additional space for ICU (Storage/Nursing stn/doctors/circulation etc) 100% extra of the bed space (keep the future requirement in mind)
- Oxygen outlets 2/bed
- Vacuum outlets 2/bed
- Compressed air outlets 1/bed
- Electric outlets 12/ bed of which 4 may be near the floor 2 on each side of the patient. Electric outlets/Inlets should be common 5/15 amp pins. Should have pins to accommodate all standard International Electric Pins/Sockets. Adapters should be discouraged since they tend to become loose.

ENVIRONMENTAL REQUIREMENTS

Heating, Ventilation and Air-Conditioning (HVAC) system of ICU

- The ICU should be fully centrally air-conditioned which allows control of temperature, humidity and air change. If this not be possible then one should have windows which can be opened ('Tilt and turn' windows are a useful design)

- Suitable and safe air quality must be maintained at all times. Air movement should always be from clean to dirty areas. It is recommended to have a minimum of six (6) total air changes per

room per hour composed of outside air. Where air-conditioning is not universal, cubicles should have fifteen air changes per hour and other patient areas at least three per hour

- The dirty utility, sluice and laboratory need five changes per hour, but two per hour are sufficient for other staff areas
- Central air-conditioning systems and re-circulated air must pass through appropriate filters
- It is recommended that all air should be filtered to 99% efficiency down to 5 microns. Smoking should not be allowed in the ICU complex
- Heating should be provided with an emphasis on the comfort of the patients and the ICU personnel
- For critical care units having enclosed patient modules, the temperature should be adjustable within each module to allow a choice of temperatures from 16 to 25 degrees Celsius
- A few cubicles may have a choice of positive or negative operating pressures (relative to the open area)cubicles usually act as isolation facilities, and their lobby areas must be appropriately ventilated in line with the function of an isolation area (I. e .pressure must lie between that in the multi-bed area and the side ward)
- Power back up in ICU is a serious issue. The ICU should have its own power backup, which should start automatically in the event of a power failure. This power should be sufficient to maintain temperature and run the ICU equipment (even through most of the essential ICU equipment has a battery backup). Voltage stabilization is also mandatory. An Uninterrupted power Supply (UPS) system is preferred for the ICU

Negative pressure isolation rooms (Isolation of patients infected/suspected to be infected with organisms spread via airborne droplet nuclei<5 lm in diameter) in these rooms the windows do not open. They have greater exhaust than supply air volume. Pressure differential of 2.5 Pa. Clean to dirty airflow i.e. direction of the airflow is from the outside adjacent space (i.e.. corridor, anteroom) into the room. Air from room preferably exhausted to the outside, but may be re-circulated provided is through HEPA filter NB: re-circulating air taken from areas intended to isolate a patient with TB is a work taking and is not recommended.

Positive pressure isolation rooms (To provide protective environment for patients at Highest risk of infection e.g. Neutopenia, post transplant) these rooms should have greater supply than exhaust air. Pressure differential of 2.5 – 8 Pa, preferably 8 Pa. Positive airflow relative to the corridor (i.e. air flows from the room to the outside adjacent space).HEPA filtration is required if air is returned.

LIGHTING

Light in room

- Natural light-Access to outside natural light is recommended
- This may improve the staff morale and the patient outcome
- Data suggests that synthetic artificial daylight use is work environment may deliver better results for night time workers
- It may be helpful in maintaining the circadian rhythm
- Natural lighting in the unit can decrease power consumption and the electrical bill which is so relevant to Indian circumstances
- Access to natural light also means one may have access to viewing external environment which may be developed into green soothing

Light for Procedures

- High illumination and spot lighting is needed for procedures, like putting central lines etc.
- They can descend from ceiling, extend from the wall/Panel, or be carried into the room
- Recommended spot lighting should be shadow free 150 foot candles (fc) strength
- Hand Hygiene and Prevention of infection
- Every bed should have attached alcohol based anti-microbial instant hand wash solution source, which is used before care giver (doctor/Nurse/relative/Paramedical)handles the patient
- An operation room style sink with elbow or foot operated water supply system with running hot and cold water supply with antiseptic soap solution source should be there at a point easily accessible and unavoidable point, where two people can wash hands at a time
- This sink should don mask and cap in ICU
- All entrants should don mask and cap in ICU
- No dirty /soiled linen/material should be allowed to stay in ICU for long times for fear of spread of bad odour, infection and should be disposed off as possible. Dirty linen should be replace regularly at fixed intervals
- All surroundings of ICU should be kept absolutely clean and green if possible for obvious reasons

b) The Guidelines for general Environment of Operation Theater

Air Conditioning

The air conditioning requirements for Operation Theater in an HCO have been deliberated at length with manufactures, engineers, technical committee members and other stake holders and the following guidelines have been finalized. For this purpose operation theaters have been divided into two distinct groups:

a. Superspeciality OT: Superspeciality OT means operations of Neurosciences, Orthopedics (Joint Replacement), Cardiothoracic and Transplant Surgery (Real, Liver).

b. General OT : This includes ophthalmology and all other basic surgical disciplines. District hospital OTs and FRU OT would fall under this category.

1. REQUIREMENTS- SUPER SPECIALTY OT

i) Air Changes Per Hour :

- Minimum total air changes should e thirty (30) based on international guidelines although the same will vary with biological load and the location.
- The fresh air component of the air changes is required to be minimum 5 air changes out of the total minimum 30 air changes.
- If HCO chooses to have 100% fresh air changes system than appropriate energy saving devices like Heat Recovery Wheel, Run around Pipes etc should be installed.

ii) Air Velocity:

The Vertical down flow of air coming out o the diffusers should be able to carry bacteria carrying particle load away from the operating table. The airflow needs to e unidirectional and downwards on the OT table. The air velocity recommended as per the international and national guidelines is 90-120 FPM at the grille/Diffuser level.

iii) Positive Pressure:

There is a requirement to maintain positive pressure differential between OT and adjoining areas to prevent outside air entry into OT. The minimum positive pressure recommended is 15 Pascal (0.05 inches of water) as per ISO 14644 clean room standard.

iv) Air handling in the OT including air quality:

Air is supplied through terminal HEPA filters in the ceilings. The minimum size of the filtration areas should be 8x6 to cover the entire OT table and surgical team The minimum supply air volume to the OT (in CFM) should be complaint with the desired minimum 8 change. The return air should be picked up, taken from the exhaust grill located near the floor level (APPX 6 inches above the floor level). The air quality at the supply i.e. at grill level should be class 100/ISO Class 5 (At rest conditions). Class 100 means a cubic foot of air and must have no more than 100 particles measuring 0.5 microns or larger.

V) Temperature and Humidity:

The temperature should be maintained at 21 +/-3 Deg C inside the OT room all the time with corresponding relative humidity between 40 to 60% though the ideal RH is considered to be 55%. Appropriate devices to monitor and display these conditions inside the OT room may be installed.

VI) Air Filtration:

The AHU must be an air purification unit and air filtration unit. There must be two sets of washable flange type pre filters of capacity 10 microns and microns with aluminum/SS 304 frame within the AHU. The necessary service panels to be provided for servicing the filters, motors & blowers. HEPA filters of efficiency 99.97% down to 0.3 microns or higher efficiency are to be provided in the OT and not in the AHU.

2. REQUIREMENTS – GENERAL OT

I. Air Change Per Hour:

- Minimum total air changes should be 25 based on international guidelines although the same will vary with biological load and location
- The fresh air component of the air change is required to be minimum 4 air changes out of total minimum 25 air changes

II. Air velocity:

The vertical down flow of air coming out of the diffusers should be able to carry Bacteria carrying particle load away from the operating table. The airflow needs to be unidirectional and downwards on the OT table.

III. Positive Pressure:

There is requirement to maintain positive pressure differential between OT and adjoining areas to prevent outside air entry into OT. The minimum positive pressure recommended is 15 Pascal (0.05 inches of water) as per ISO 14644 Clean Room Standard.

IV. Air handling in the OT including Air Quantity:

Air is supplied through HEPA filters in AHU. The minimum size of the air supply area should be 6’ x 4’ to cover the entire OT table and surgical team The minimum supply air volume to the OT (in CFM) should be compliant with the desired minimum air change. The return air should be picked up/ taken out from the exhaust grille located near the floor level (approx 6 inches above the floor level). The air quality at the supply i.e. at grille level should be Class1000/ISO Class 6 (at rest condition).Class 1000 means a cubic foot of air must have no more than 1000 particles measuring 0.5 microns or larger.

V. Temperature and Humidity

The temperature should be maintained at 21 +/- 3 Deg C inside the OT all the time with corresponding relative humidity between 40 to 60% through the ideal RH is considered to be 55% Appropriate devices to monitor and display these conditions inside the OT may be installed.

VI. Air Filtration

The AHU must be an air purification unit and air filtration unit. There must be two sets of washable flange type pre filters of capacity 10 microns and 5 microns with aluminum/SS 304 frame within the AHU. The necessary service panels to be provided for servicing the filters, motors & blowers. HEPA filters of efficiency 99.97% down to 0.3 microns or higher efficiency may be provide in the AHU.

3. General Guiding Notes:

a. The AHU of each OT should be dedicated one and should not be linked to air conditioning of any other area
b. During the non functional hours AHU blower will be operational round the clock (may be without temperature control).VFD devices may be used to conserve energy
c. Window & split A/C should not be used in any type of OT because they are pure re circulating units and have convenient pockets for microbial growth which cannot be sealed
d. The flooring, walls and ceiling should be non porous, smooth, seamless without corners and should be easily cleanable repeatedly. The material should be chosen accordingly
e. Validation of system to be done as per ISO 14664 standards and to be necessarily include:
    - Temperature and Humidity check
    - Air particulate count
    - Air change rate calculation
    - Air velocity at outlet of terminal filtration unit/filters
    - Pressure differential levels of the OT wrt ambient /adjoining areas
    - Validation of HEPA filters by appropriate tests like DOP etc.

f. Maintenance of the system: it is recommended that periodic preventive maintenance be carried out in terms of cleaning of pre filters at the interval of 15 days. Preventive maintenance of all the parts is carried out as per manufacturer recommendations.

ANNEXURE 9

List of Invasive, High-Risk or Surgical Procedures

1. Any procedures involving skin incision
2. Any procedures involving general or regional anesthesia, monitored anesthesia care, or conscious sedation
   Injections of any substance into a joint space or body cavity
3. Percutaneous aspiration of body fluids or air through the skin (e.g., arthrocentesis, bone marrow aspiration, lumber puncture, paracentesis, thoracentesis, suprapubic catheterization, chest tube)
4. Biopsy (e.g., bone marrow, breast, liver, muscle, kidney, genitourinary, prostate, bladder, skin)
5. Cardiac procedures (e.g., cardiac catheterization, cardiac pacemaker implantation, angioplasty, stent implantation, intra-aortic balloon catheter insertion, elective cardioversion)
6. Endoscopy (e.g., colonoscopy, bronchoscopy, esophagogastric endoscopy, cystoscopy, percutaneous endoscopic gastrostomy, J-tube placements, nephrostomy tube placements)
7. Laparoscopic procedures (e.g., laparoscopic cholecytectomy, laparoscopic nephrectomy)
8. Invasive radiological procedures (e.g., angiography, angioplasty, angioplasty, percutaneous biopsy)
9. Dermatology procedures (biopsy, excision and deep cryotherapy for malignant lesions – excluding cryotherapy for benign lesions)
10. Invasive ophthalmic procedures, including miscellaneous procedures involving implants
11. Oral procedures including tooth extraction and gingival biopsy
12. Podiatric invasive procedures (removal of ingrown toenail, etc.)

13. Skin or wound debridement performed in an operating/ procedure room
14. Electroconvulsive treatment Radiation oncology procedures
15. Central line payment
16. Kidney stone lithotripsy
17. Colposcopy, and / or endometrial biopsy

❖ Procedures NOT considered surgical, high-risk or invasive include the following:

- ✓ Electrocautery of lesion
- ✓ Venipuncture
- ✓ Manipulation and reductions
- ✓ Chemotherapy/oncology procedure
- ✓ Intravenous therapy
- ✓ Nasogastric tube insertion
- ✓ Foley catheter insertion
- ✓ Flexible sigmoidoscopy
- ✓ Vaginal exams (Pap smear)