Inodaya Hospitals

HOSPITAL INFECTION CONTROL MANUAL

HIC MANUAL

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THE INFECTION CONTROL PROGRAM

1.1 Philosophy

Introduction: Nosocomial or hospital acquired infections are major public health problems in hospitals throughout the world. Nosocomial infections represent a leading cause of death. Nosocomial infections, such as bacteremias, surgical wound infection, pneumonia and urinary tract infection, are also associated with major morbidity in hospitalized patients. These nosocomial infections add significantly to the expected length of stay for patients. A study on the efficacy of nosocomial infection control project, conducted by the Center for Disease Control, found that up to one third of nosocomial infections could be prevented by an effective infection control program.

Philosophy: An infection control program is essential to the modern hospital because it provides guidelines and standards for the prevention, recognition and control of infection in patients, personnel and visitors within the hospital community.

INODAYA HOSPITALS endeavors to have a robust infection control program in place. The goal of the organization's infection surveillance, prevention and control program is to identify and reduce the risks of acquiring and transmitting infections among patients, staff, doctors, contract workers, volunteers, students and visitors.

It also endeavors to safeguard patients, personnel and visitors and helps in providing a safe environment to all.

Hospital acquired infection may originate from endogenous or exogenous sources and occur during hospitalization of the patients. For an infection to be defined as hospital acquired infection there must be no evidence that the infection was present or incubating at the time of hospital admission. Most frequently acquired hospital acquired infections are surgical site

infections, Ventilator Associated pneumonia, urinary tract infection and blood stream infections.

INODAYA Hospitals is committed to the prevention of all the hospital-acquired infections through its infection control policies and guidelines as stated in the infection control manual. Specific guidelines & standard operative procedures on the prevention of Nosocomial infections have been formulated as per the CDC & NACO guidelines.

The infection control committee at **INODAYA HOSPITALS** is responsible for providing the guidelines for the prevention and control of infection in patients and personnel. Every individual is responsible for compliance with hospital-wide and departmental infection control policies and procedures.

Standard precautions provide a consistent approach to managing contact with body substances from all patients and are essential to prevent transmission of potentially infectious agents, from patient to patient, from one body site to another within the same patient, from patient to health care worker and from health care worker to patient.

The individual is responsible for compliance with infection control and safety policies and procedures to include:

a. Standard precautions,
b. Other administrative or departmental policies and procedures.

1.2 The role and scope of department policy participation and revision

Policy

Each clinical department head will be responsible for implementing infection control policies within their department. These policies will be reviewed with the infection control committee upon completion and periodically/ as needed thereafter.

Scope

This applies to all departments that provide direct patient care and/or have contact with patient equipment.

Purpose

1. To provide infection control policies for the personnel working in the individual departments.
2. To review and to update departmental infection control policies.
3. To assure participation of all employees in the infection control program for the protection of all patients, personnel and visitors.

Procedure

1. Each clinical department will implement infection control policies as per the guidelines and policies laid down in the infection control manual.
2. The department head, the infection control staff as well as the quality assurance department will review the policy periodically. Revisions will be made if necessary.
3. The policies, when completed will be submitted to the infection control committee for approval.
4. Policies, following review, will be appropriately updated and returned to the department.
5. The department head will then be responsible for notifying employees in the department of any revisions, if made.
6. All staff will be responsible for learning and using measures as described in their specific policies and the infection control manual.
7. The department head will be responsible for enforcing hospital-wide infection control policies, as well as their own departmental infection control policies.
8. The clinical department heads will be responsible for assuring that staff attends periodic safety review, which includes infection control training. HR Manager will be responsible for assuring that records of training and education are kept for review by appropriate agencies.
9. The department will adhere to the requirements of the employee health service, as approved by the infection control committee (section 5 – IC manual).

10. Where work conditions require contact with body substances, standard precautions will be followed. Personal protective equipment (PPE) and other safety equipment appropriate to the activity will be used. Use of safety equipment will be based on the degree of risk of exposure, not on diagnosis unless a particular isolation precaution applies.

1.3 The infection control committee (ICC)

A competent and active infection control committee is the most important part of the program for prevention and control of nosocomial infections among patients and personnel. The committee meets at least once a month. There is a planned agenda for each meeting and minutes are kept. The committee reviews data concerning infections and infection risks and recommends policies to appropriate medical staff committees, hospital administration, and hospital personnel. The committee may develop, recommend, and set policies. All the department heads have line responsibility for implementation of these policies.

1.3.1 Membership and department representation:

The infection control committee is a medical staff committee. Membership includes representation from the medical staff, hospital administration, department of nursing, and the infection control cell. Representation from supporting services is used on a consultative basis. The committee members are representatives of the following departments:

a. General surgery
b. Critical care
c. Nursing
d. Housekeeping
e. Engineering
f. Infection control nurse

The ICC is chaired by the Medical Superintendent or a senior clinician. Infection control team (ICT) is the functional unit of ICC and it consists of an infection control nurse (ICN) and an

infection control officer (Microbiologist). The ICT is responsible for bringing infection control matters to the ICC. The ICN may provide clinical surveillance as a routine and also during the outbreaks. The ICN also has particular responsibility for the application of policies and procedures and for training of staff in close collaboration with the training cell of the hospital.

The ICC provides advice and guidelines on the following subjects

- Safety measures to prevent infections to the patients.
- Efficient and standardized use of antiseptics, disinfectants and products used for dis-infecting the hands.
- Quality control of techniques used to sterilize equipment in hospital with regular monitoring of sterilization cycle.
- Recommending antibiotic policy and guidelines.
- Guidelines for training of different categories of staff on infection control.
- Policies for surveillance, prevention and control of infections for patients, staff and visitors.

1.3.2 Infection control team

The ICT is the functional arm of ICC. It comprises of Infection control nurse, infection control officer (Microbiologist/ Infectious Disease Specialist).

A. The infection control officer

The Microbiologist / Physician with a background in infectious diseases is the infection control officer and is also the member secretary of infection control committee. The infection control officer is responsible for the following

1. Epidemiological survey in case of special situations.
2. Formulation and review of antimicrobial guidelines in conjunction with various specialties.
3. Monitoring the decisions of infection control committee.
4. Organization of training program for staff.

5. Defining of quality improvement initiatives and indicators for infection control parameters (e.g. SSI, BSI, UTI and VAP). Applying epidemiological principles and statistical methods, including risk stratification, to identify target population, analyze trends and risk factors, and design and evaluate prevention and control strategies.
6. Conducting on-going surveillance using Center of Disease Control (CDC) infection criteria, documentation, and investigation of nosocomial infections through review of admission diagnoses, microbiology culture results, isolation orders, patient records, consultation requests, post-discharge surveillance.

B. Microbiologist

The Microbiologist is responsible for

a. Outbreak investigations in the facility.
b. Environmental surveillance when needed.
c. Assessment of antibiogram of the isolated organism in order to assess the emergence of resistant organisms.
d. Carrying out of infection control activities as decided by ICC.
e. Assessment of disinfectants.
f. **Raising** of special organism's alert in case of isolation of those organisms e.g.: MRSA, VRE.

C. Infection Control Nurse

The infection control nurse is trained in hospital infection control principles and is responsible for the surveillance, analysis, and reporting of nosocomial infections; educating employees about infection control and ensuring the implementation of various infection control policies.

The infection control nurse is responsible for

a. Surveillance:
b. Assessing environmental control through surveillance of water supply systems as needed, air pressure relationships for high risk environmental monitoring.

c. Conduct environmental rounds in all inpatient and outpatient care areas. Collect data on the incidence of selected device use in identified intensive care units.
d. Participate in investigations of unusual hospital infection outbreaks utilizing the microbiology laboratory,
e. Evaluate the effectiveness of the surveillance plan and modification, if necessary.
f. Data: Collecting data in support of epidemiological studies of specific problems or problem areas to determine the source of the problem and make appropriate recommendations.
g. Performance improvement: Participating in quality/performance improvement activities by assessing, monitoring, and measuring nosocomial infections and evaluating outcomes on a continuous basis.
h. Assisting in coordination of regularly scheduled hospital infection control meetings and dissemination of recommendations and hospital-wide policies
i. Education: Plan, organize, develop and implement educational programs for all hospital employees including administrative and ancillary services which should convey specialized knowledge and skills to increase employee awareness of existence of nosocomial infections, techniques for prevention and to provide a safe environment for hospital employees and patients.
j. Develop appropriate informational materials at appropriate level of understanding and need.
k. Serve as a knowledgeable and available resource on infection control practices and policies to patients, families, staff, and health system employees.
l. Develop and update isolation techniques and procedures in accordance with current standards of practice, rules and regulations.

1.3.3 Nursing supervisor

The nursing in charge/supervisor of a ward is responsible for:

a. Maintaining hygiene in the ward.
b. Keeping a close watch on the aseptic and antiseptic techniques.

c. Raising alerts on signs and symptoms of infection, fever, discharge etc to the clinician at the earliest.
d. Implementation of various infection control policies in the unit.
e. Coordinating with Infection control nurse on a day-to-day basis.
f. Following the isolation protocols.

1.3.4 Hospital pharmacist

a. Obtaining, storing and distributing medicinal preparations in such a way that infectious agents are not transmitted to the patients.
b. Dispensing antimicrobial agents as per hospital policy and holding all the relevant documents.
c. Obtaining and storing vaccines and sera.
d. Provision of data about usage of all antimicrobials in the hospital to ICC.

1.4 Hospital surveillance

Surveillance of endemic and epidemic nosocomial infections and risk factors related to those infections in patients and health care workers is an on-going process. The Infection control cell will develop a surveillance plan to the infection control committee annually, for approval.

The infection control department has identified High risk Areas hospital wide for the surveillance activities and other infection control measures. These areas shall specially be focused for appropriate infection control measures.

Surveillance activities are appropriately directed towards the identified high-risk areas

- Operation theatres
- Laboratory
- Intensive care areas

- Post-operative ward
- CSSD

1.4.1Definitions

Identification of nosocomial versus community-acquired infection is based upon the definitions developed by the Centers for Disease Control and Prevention (CDC)

1.4.2Rationale

Surveillance is a process for monitoring specific outcomes of patient care delivery related to infection risk factors and infection prevention/control activities. It provides baseline and trend data for use in problem identification, monitoring and for assessment of outcomes related to interventions. It assists in targeting intervention and identifying educational needs.

1.4.3 Patient populations

a) Inpatient
b) Outpatient
c) Health care workers and volunteers

1.4.4 Methods for reporting and follow-up

a) The goal of reporting and follow-up is to focus on interventions that will improve patient outcomes.
b) "Surveillance" reporting will be an on-going component of the infection control committee agenda.
c) Reports will be given to the appropriate unit, department, service, or committee in a timely manner by the infection control, or through the quality improvement department for medical staff issues as appropriate.
d) Whenever possible, infection indicators will be expressed as rates while reporting data. Denominators will vary based on appropriateness and availability (e.g. admissions, discharges, patient days, procedures, device days, at-risk days).

1.4.5 Responsibilities

a) Data collection: Infection Control Officers (ICO), Infection Control Nurse, Human Resource, and quality assurance personnel.
b) Data evaluation: infection control cell, training cell
c) Follow-up: The infection control committee with appropriate unit(s), department(s), service(s), or committee(s).
d) Health care worker issues will be the primary responsibility of Human resource department. Infection control committee will provide consultation and support.

1.4.6 Data Collection Methods

a) Microbiology laboratory reports
b) Patient records
c) Pathology reports
d) Pharmacy
e) Existing databases
f) Verbal or written reports

1.4.7 Outbreak investigation

a) Single occurrences of unusual diseases/organisms will trigger investigation.
b) Clusters/ outbreak in any patient or health care worker population will trigger investigation

1.5 Criteria for defining nosocomial infections

Infection is the presence of an organism(s) in body tissue or fluids accompanied by a clinically adverse effect (either locally or systemically) on the host. Infection must be distinguished from colonization, which is the persistence of organisms on skin, in body tissues, or in body fluids but without a clinically adverse effect and inflammation which is a condition that results from tissue response to injury or stimulation by noninfectious agents (i.e. chemicals). Infections that occur during hospitalization but are neither present nor

incubating upon hospital admission are defined as nosocomial or hospital acquired infections.

Nosocomial infections may originate from either endogenous or exogenous sources. Endogenous infections are those caused by microorganisms that are already part of the host flora ("normal flora" of the skin, nose, oral cavity, gastrointestinal tract, etc.) while exogenous infections are those caused by microorganisms obtained from animate or inanimate sources within the hospital. The term "nosocomial infection/ Health Care Associated Infection (HCAI)" will thus include potentially preventable infections as well as some infections that may be regarded as inevitable.

The Center for Disease Control of the U.S. Department of Health and Human Services sets definitions for surveillance of nosocomial infections. The definitions are based on several important principles.

1.5.1 Principles used in definitions of nosocomial infections/ HCAI:

A. Information used to determine the presence and classification of an infection involves various combinations of clinical findings and results of laboratory and other diagnostic tests. Clinical evidence is derived from direct observation of the patient or review of information in the patient's chart or other ward/ unit records. Laboratory evidence consists of results of cultures, antigen or antibody-detection tests, and microscopic visualization methods. Supportive data is derived from other diagnostic studies, such as results of x-ray studies, ultrasound examination, computed tomography (CT) scan, magnetic resonance imaging, radio nucleotide scans, endoscopic procedures, biopsies, and needle aspiration.

B. Physician's or surgeon's diagnosis of infection derived from direct observation during surgery, endoscopic examination, or other diagnostic study, or based on clinical judgment, is an acceptable criterion for an infection, unless there is compelling evidence to the contrary.

C. For an infection to be defined as nosocomial there must be no evidence that the infection was present or incubating at the time of hospital admission.

Infection that is acquired in the hospital and becomes evident after hospital discharge **is also considered nosocomial.**

1.5.2 Definitions for the most frequently noted nosocomial infections

Surgical site infection, primary bloodstream infection, pneumonia, and urinary tract infection are the most frequently noted nosocomial infections. Definitions for these infections are presented first and are followed by other sites of infection listed alphabetically

A. Surgical Site Infection

Surgical site infection includes superficial surgical site infection, deep surgical wound infection and organ/space surgical site infection.

a) Superficial surgical site infection must meet the following criteria: Infection occurs within 30 days after surgery and involves only skin and subcutaneous tissue of the incision and any of the following:

i) Purulent discharge from the superficial incision.

ii) Organism isolated from an aseptically obtained culture of fluid or tissue from superficial incision.

iii) Surgeon deliberately opens wound because of pain or tenderness, localized swelling, redness or local rise of temperature, unless wound is culture-negative

iv) Surgeons or attending physician's diagnosis of superficial infection.

b) Deep surgical site infection must meet the following criteria: Infection occurs within 30 days after surgery if no implant (a non-human derived implantable foreign body) is left in place, or within 1 year if implant is in place and infection appears related to surgery and infection involves deep, soft tissues (e.g. facial and muscle layer) and any of the following:

i) Purulent discharge from deep incision but not from organ/space component of surgical site.

ii) A deep incision spontaneously dehisces or is deliberately opened by surgeon when patient has fever (greater than38°C) and/or localized pain or tenderness, unless wound is culture-negative.

iii) An abscess or other evidence of infection involving deep incision found on direct examination, during reoperation, or by histopathologic or radiologic examination.

iv) Surgeons or attending physician's diagnosis of infection.

c) Organ/space surgical site infection must meet the following criteria:

Infection occurs within 30 days after surgery if no implant (a non-human derived implanted foreign body) is left in place, or within 1 year if implant is in place and infection appears related to surgery and infection involves any part of body excluding the skin incision, fascia or muscle layers, that is opened or manipulated during surgery and any of the following:

i) Purulent drainage from drain placed through a stab wound into the organ/space.

ii) Organism isolated from aseptically obtained culture of fluid/tissue in the organ/space.

iii) An abscess or other evidence of infection involving organ/space found on direct examination during reoperation, by histopathological or radiological examination.

iv) Surgeons or attending physician's diagnosis of infection.

B. Primary bloodstream infection

Primary bloodstream infection includes laboratory-confirmed bloodstream infection and clinical sepsis. The definition of clinical sepsis is intended primarily for infants and neonates.

a) Laboratory-confirmed bloodstream infection must meet one of the following criteria:

i) Recognized pathogen isolated from one or more blood cultures and pathogen is not related to infection at another site.

ii) One of the following: fever (greater than38°C), chills, or hypotension and any of the following:

- Common skin contaminant isolated from two or more blood cultures drawn on separate occasions.
- Common skin contaminant isolated from blood culture from patient with intravascular line and physician institutes appropriate antimicrobial therapy
- Positive antigen test on blood, signs and symptoms and positive laboratory results are not related to infection at another site

iii) Patient less than 12 months of age has one of the following: fever (greater than38°C) hypothermia (less than37°C), apnea, or bradycardia and any of the following:

- Common skin contaminant isolated from two or more blood cultures drawn on separate occasions.
- Common skin contaminant isolated from blood culture from patient with intravascular line and physician institutes appropriate antimicrobial therapy.
- Positive antigen test on blood, signs and symptoms and positive laboratory results are not related to infection at another site

b) Clinical sepsis must meet either of the following criteria:

i. One of the following clinical signs or symptoms with no other recognized cause: fever (greater than38°C), hypotension (systolic pressure less than90 mm Hg), or oliguria (less than20 ml/hr) and all of the following:

- Blood culture not done or no organism or antigen detected in blood
- No apparent infection at another site
- Physician institutes appropriate antimicrobial therapy for sepsis

ii. Patient less than 12 months of age has one of the following clinical signs or symptoms with no other recognized cause: fever (greater than38°C), hypothermia (less than37°C), apnea, or bradycardia and all of the following:

- Blood culture not done or no organism or antigen detected in blood
- No apparent infection at another site
- Physician institutes appropriate antimicrobial therapy for sepsis

C. Pneumonia:

Pneumonia is defined separately from other infections of the lower respiratory tract. The criteria for pneumonia involve various combinations of clinical, radiographic, and laboratory evidence of infection. In general, expectorated sputum cultures are not useful in diagnosing pneumonia but may help to identify the etiologic agent and provide useful antimicrobial susceptibility data. Findings from serial chest x-ray studies may be more helpful than those from a single x-ray film. Pneumonia must meet one of the following criteria:

a) Dullness to percussion on physical examination of chest and any of the following:

i) New onset of purulent sputum or change in character of sputum

ii) Organism isolated from blood culture

iii) Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy

b) Chest radiographic examination shows new or progressive infiltrate, consolidation, cavitation or pleural effusion and any of the following:

i) New onset of purulent sputum or change in character of sputum

ii) Organism isolated from blood culture

iii) Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy

iv) Isolation of virus or detection of viral antigen in respiratory secretions

v) Diagnostic single antibody titer (IgM) or fourfold increase in paired serum samples (IgG) for pathogen

vi) Histopathologic evidence of pneumonia

c) Patient less than 12 months of age has two of the following: apnea, tachypnea, bradycardia, wheezing, rhonchi, or cough and any of the following:

i) Increased production of respiratory secretions
ii) New onset of purulent sputum or change in character of sputum
iii) Organism isolated from blood culture
iv) Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy
v) Isolation of virus or detection of viral antigen in respiratory secretions
vi) Diagnostic single antibody titer (IgM) or fourfold increase in paired serum samples (IgG) for pathogen
vii) Histopathologic evidence of pneumonia

d) Patient less than12 months of age has chest radiologic examination that shows new or progressive infiltrate, cavitation, consolidation, or pleural effusion and any of the following:

i) Increased production of respiratory secretions
ii) New onset of purulent sputum or change in character of sputum
iii) Organism isolated from blood culture
iv) Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy
v) Isolation of virus or detection of viral antigen in respiratory secretions
vi) Diagnostic single antibody titer (IgM) or fourfold increase in paired serum samples (IgG) for pathogen
vii) Histopathologic evidence of pneumonia

D. Urinary Tract Infection

Urinary tract infection includes symptomatic urinary tract infection, asymptomatic bacteriuria, and other infections of the urinary tract.

a) Symptomatic urinary tract infection must meet one of the following criteria:

i) One of the following: fever (greater than38°C), urgency, frequency, dysuria, or suprapubic tenderness and an aseptically obtained urine culture of greater than10^5 colonies/ml urine with no more than two species of organisms

ii) Two of the following: fever (greater than38°C), urgency, frequency, dysuria, or suprapubic tenderness and any of the following:

- Dipstick test positive for leukocyte esterase and/or nitrate
- Pyuria (greater than10 white blood cells [WBC]/cu.mm or greater than3 WBC/high-power field of unspun urine)
- Organisms seen on gram stain of unspun urine
- Two urine cultures with repeated isolation of the same uropathogen with greater than10^2 colonies/ml urine in non-voided specimens
- Urine culture with less than10^5 colonies/ml urine of single uropathogen in patient being treated with appropriate antimicrobial therapy
- Physician's diagnosis
- Physician institutes appropriate antimicrobial therapy

iii) Patient less than12 months of age has one of the following: fever (greater than38°C) hypothermia (less than37°C), apnea, bradycardia, dysuria, lethargy, or vomiting and urine culture of greater than10^5 colonies/ml urine with no more than two species of organisms

- Dipstick test positive for leukocyte esterase and/or nitrate
- Pyuria
- Organisms seen on Gram stain of unspun urine
- Two urine cultures with repeated isolation of same uropathogen with greater than10^2 organisms /ml urine in non-voided specimens
- Urine culture with less than10^5 colonies/ml urine of a single uropathogen inpatient being treated with appropriate antimicrobial therapy
- Physician's diagnosis
- Physician institutes appropriate antimicrobial therapy

b) Asymptomatic bacteriuria must meet either of the following criteria:

i) An indwelling urinary catheter is present within 7 days before urine is cultured and patient has no fever (greater than38°C), urgency, frequency, dysuria, or suprapubic tenderness and has urine culture of greater than10^5 organism's /ml urine with no more than two species of organisms

iii) No indwelling urinary catheter is present within 7 days before the first of two urine cultures with greater than10^5 organism's /ml urine of the same organism with no more than two species of organisms, and patient has no fever (greater than38°C), urgency, frequency, dysuria, or suprapubic tenderness.

c) Other infections of the urinary tract (kidney, ureter, bladder, urethra or tissues surrounding the retroperitoneal or perinephric spaces) must meet one of the following criteria:

i) Organism isolated from culture of fluid (other than urine) or tissue from affected site

ii) An abscess or other evidence of infection seen on direct examination, during surgery, or by histopathologic examination

iii) Two of the following: fever (greater than38°C), localized pain, or tenderness at involved site and any of the following:

- Purulent drainage from affected site
- Organism isolated from blood culture
- Radiographic evidence of infection
- Physician's diagnosis
- Physician institutes appropriate antimicrobial therapy

iv) Patient less than12 months of age has one of the following: fever (greater than38°C) hypothermia (less than37°C), apnea, bradycardia, lethargy, or vomiting and any of the following:

- Purulent drainage from affected site
- Organism isolated from blood culture
- Radiographic evidence of infection

- Physician's diagnosis
- Physician institutes appropriate therapy

(Adapted from**:** CDC definitions for nosocomial infections)

Section 2: Isolation and Standard precaution

2.1 Isolation precautions

The guideline for isolation precautions in hospitals has been defined to meet the following objectives:

(1) To be epidemiologically sound,

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

(3) To contain adequate precautions for infections transmitted by the airborne, droplet, and contact routes of transmission,

(4) To be as simple and user friendly as possible,

These guidelines are designed for the care of all patients in hospitals regardless of their diagnosis or presumed infection status. Implementation of these "standard precautions" is the primary strategy for successful nosocomial infection control and a procedure is available on “prevention of occupational exposure in healthcare workers “

2.1.1 Definitions

A. Communicable disease:

Defined as an illness due to specific infectious agent or its toxic product(s) capable of being directly or indirectly transmitted from man to man, from animal to man, from environment through air/ dust/ water/ food etc to man.

B. Contact transmission:

a. Direct: body surface to body surface contact and physical transfer of micro-organisms between a susceptible host and an infected or colonized person e.g. turning a patient, bathing a patient, performance of other patient care activities that require direct personal contact.

b. Indirect: contact of a susceptible host with contaminated usually inanimate object e.g. contaminated needles, instruments, dressings, contaminated gloves worn on hands in between two patients etc.

C. Droplet transmission:

Droplets are generated from a person primarily during coughing, sneezing, talking and during performance of certain procedures e.g. suction, bronchoscopy etc. These are propelled through short distances and do not remain suspended in air.

D. Airborne transmission:

Dissemination of airborne droplet nuclei of evaporated droplets containing microorganisms that remains suspended in the air for long periods of time or dust particles containing the infectious agent.

Reference

HICPAC (Hospital Infection Control Practices Advisory Committee), **CDC**: "guideline for isolation precautions in hospitals", American journal of infection control, (February 1996; 24(1): 24.)

2.1.2. Isolation precautions reference table

Standard (body substance isolation) precautions must be applied in each circumstance.

S.No	Infection condition or organism	Duration of precautions	Precaution
1	Adenoviruses (Respiratory infection)	For 7 days after onset of symptoms	Respiratory secretions***
2	Chickenpox and Disseminated Herpes Zoster are caused by the same virus from the Herpes family	Persons susceptible to varicella should not enter the room	Airborne**
3	Chickenpox	Until all lesions are crusted. For exposed, susceptible patients from 10 until 21 days after last day of exposure (up to 28 days if VZIG	Airborne**

		given).	
4	Disseminated Herpes Zoster	Duration of hospitalization	Airborne**
5	Localized Herpes Zoster (Shingles) (immunosuppressed patient)	Duration of hospitalization	Airborne**
6	Localized Herpes Zoster (Shingles)	Duration of hospitalization	Airborne**
7	C. Difficile		Hand washing sign
8	Diphtheria (pharyngeal)	Until after 2 cultures, taken at least 24 hrs apart, are negative (following appropriate therapy)	Respiratory secretion*
9	*Haemophilus influenzae* pneumonia/meningitis, Pediatrics only	Until after 24 hrs of appropriate antibiotic therapy	
10	Hepatitis A, B, and C		Standard*
11	Herpes simplex		Standard*
12	HIV, AIDS		Standard*
13	Influenza (Type A, B, C)	For 7 days after onset of symptoms	Respiratory secretions*

*** Standard precautions as defined in 2.2**

**** Airborne (droplet nuclei)**

(Measles, Varicella, Tuberculosis)

For patient known or suspected to be infected with micro-organisms transmitted by airborne droplet nuclei.

1. Patient placement

i) Place the patient in private room that has monitored negative air pressure in relation to surrounding areas with 6-12 air changes/hour and with appropriate discharge of air outdoors

ii) Keep the door closed

iii) When a private room is not available the patient can be cohorted with patient with same micro-organisms

2. Respiratory precaution

i) Wear respiratory protection while entering the room of such patients

ii) Susceptible persons should not enter the room of patients with measles or varicella.

3. Patient transports

i) Limit the movement and transport of patient from the room for essential purpose only. If the transportation is needed then prevent transmission by placing a surgical mask on the patient

***** Respiratory: droplet precaution**

(Viral: Adenovirus, Influenza, and Mumps, Parvovirus**,** Rubella)

Bacteria: Diphtheria, Mycoplasma, Pertussis, Streptococcal laryngitis/pneumonia, Invasive Hemophilus influenzae B, Invasive **Neisseria** meningitides)

In addition to standard precautions, use droplet precautions for a patient known or suspected to be infected with micro-organisms transmitted by droplets that can be generated by the patient during coughing, sneezing, talking etc.

1. Patient placement

i. Place the patient in a private room/cohort the patient

ii. When a private room is not available and cohorting is not achievable, maintain a spatial separation of at least 3 feet between the infected patient and other patients/visitors.

iii. Special air handling and ventilation are not necessary.

2. Mask

   i. In addition to standard precautions wear a mask when working with in 3 feet of the patient

3. Patient transport

   i. Limit the movement and if necessary minimize patient dispersal of droplets by masking the patient

****** Contact precautions**

(Shigella, Salmonella, Clostridium Difficile positive stools, Cholera, Scabies, Staphylococcus furunculosis, Cutaneous diphtheria, HSV, Hepatitis A and E virus, Rotavirus)

1. Patient placement

   i) Place the patient in a private room/ cohorted patient

   ii) When a private room is not available and cohorting is not achievable, maintain a spatial separation keeping in view the epidemiology of the microorganism

   iii) Special air handling and ventilation are not necessary.

2. Gloves and gowns

   i) Wear clean, nonsterile gloves before entering the room. During provision of care to such a patient change of gloves shall be undertaken after having contact with infective material

   ii) Remove gloves before leaving the patient's environment and wash hands immediately.

   iii) Hands shall not touch potentially contaminated environment surfaces or items in the patient room after removal of gloves and hand washing

   iv) A clean non sterile gown shall be worn while entering the room if substantial contact with patient, environmental surfaces or other items in patient room is anticipated Gowns shall be discarded in appropriate disposal bags, just before leaving the room

v) Contact precautions for wounds, abscesses etc are maintained till the wound is draining or till the lesions have crusted (esp. for chicken pox) or till the patient becomes non infectious.

vi) Waste disposal bins are placed as close to the exit point of the area as possible

3.Patient transport

i) Limit the movement

2.2 Standard precautions (body substance isolation /precautions)

Introduction

Standard precautions represents a system of barrier precautions to be used by all personnel for contact with blood, all body fluids, secretions, excretions, non-intact skin, and mucous membranes of all patients, regardless of the patient's diagnosis. These precautions are the "standards of care." This system embodies the concepts of "universal precautions" and "body substance isolation/ precautions "

Standard precautions focus on reducing the risk of transmission of microorganisms. The use of barriers is determined by the care provider's "interaction" with the patient and the level of potential contact with body substances.

2.2.1. Policy

A. The purpose is to reduce transmission of infectious agents between patients, caregivers, and others in the medical center environment, and to reduce the incidence of nosocomial infections among patients.

B. Hospital departments and clinics will incorporate standard precautions into departmental policies and procedures to be reviewed at least every two years by that department and the infection control committee.

C. Ongoing education concerning standard precautions principles will be given to newly hired employees involved directly or indirectly in patient care. Review classes will be provided as needed for dissemination of new information or for reinforcement upon

request of the department manager. Documentation of training will be maintained by the individual departments.

D. Standard precautions will be followed by all personnel and will be based on the degree of anticipated exposure to body substances. It is the responsibility of the individual to comply with all isolation precautions.

2.2.2. Hand Hygiene-WHO Five Moments in hand hygiene

A. As nosocomial infections are mostly spread by contact and the most common form of contact is hand contact, hand washing is the most important and most effective means of preventing nosocomial transmission of organisms.

B. Hand wasHing products.

a) In patient care areas, liquid or foam soap will be used for hand washing.

b) Antimicrobial agents are recommended for use prior to invasive procedures, in critical care units, and for patients on special organism precautions.

c) When hands are not visibly soiled, an alcohol-based agent or antiseptic will be used.

d) Employees with skin sensitivities may use a personal product, preferably in dispenser form.

C. Hand washing procedure

a) Lather well with special attention to areas around nails and between fingers for a minimum of 40 of 60 seconds.

b) Rinse well with running water.

c) Dry thoroughly with paper towels. Use paper towel to turn off faucet.

d) WPNH hands:

i) Before patient contact

ii) Before invasive procedures (use an antimicrobial agent)

iii) After removing gloves or other personal protective equipment

iv) After contact with body substances or articles/surfaces contaminated with body substances

v) Before preparing or eating food

vi) After personal contact that may contaminate hands (e.g. covering sneeze, blowing nose, using bathroom etc.

2.2.3. Personal Protective Equipment (PPE)

A. Gloves

Disposable (single use) gloves shall be readily available in patient care and specimen handling areas.

a) Gloves must be worn for:

i) Anticipated contact with moist body substances, mucous membranes, tissue, and non-intact skin of all patients;
ii) Contact with surfaces and articles visibly soiled/contaminated by body substances;
iii) Performing venipuncture or other vascular access procedures (IV starts, phlebotomy and in-line blood draws);
iv) Handling specimens when contamination of hands is anticipated

b) Don gloves at bedside, immediately prior to task.

c) Replace torn, punctured or otherwise damaged gloves as soon as patient safety permits.

d) Remove and discard gloves after each individual task involving body substance contact, before leaving the bedside.

e) Gloves should not be worn:

i) Away from the bedside or lab bench
ii) At the nursing station
iii) To handle charts, clean linen, clean equipment or patient care supplies
iv) In hallways or elevators.

f) WPNH hands as soon as possible after glove removal or removal of other protective equipment. Gloves are not to be washed or decontaminated for reuse (exception: utility gloves)

g). Caution: Gloves do not provide protection from needle sticks or other puncture wounds caused by sharp objects. Use extreme caution when handling needles, scalpels, etc.

h). Additional glove information:

i). **Unsterile gloves:** Vinyl and latex gloves are equally effective in preventing skin contact with microorganisms. Choose the size that best fits your hands. They should be used for contact with chemotherapy agents and with blood and body fluids of patients receiving chemotherapy.

ii). **Sterile gloves** are available on supply carts in patient care areas and should be worn when aseptic technique is required.

iii). **Hypoallergenic and powder-free gloves** are available for individuals who are allergic to latex or powder.

iv). **Utility gloves** (not for direct patient care) used by housekeepers, plumbers, etc. may be decontaminated and reused, provided the integrity of the glove is not compromised. They must be discarded if cracked, peeled, torn, and punctured or when their ability to function as a barrier is compromised.

B. Masks, eye protection and face shields

Wear masks in combination with eye protection devices (goggles or glasses provide with side shields) or chin-length face shields during procedures that are likely to generate droplets, spray, or Spill of body substances to prevent exposure to mucous membranes of the mouth, nose and eyes. Masks are also worn to protect personnel from transmission of infectious droplets during close contact with the symptomatic patient.

Situations, which may increase risk of spill / splatter, include the following

a) Trauma care
b) Surgery
c) Intubation/ suctioning /extubation (including code situations)
d) Bronchoscopy/ endoscopy
e) Emptying bedpans/ suction canisters into hopper/toilet
f) Code blue

g) Patient care of coughing patient with suspected infectious etiology

C. Aprons, gowns, and other protective body clothing

The appropriate type of garment shall be based on the task and the degree of exposure anticipated. Gowns are worn to prevent contamination of clothing and protect the skin of personnel from blood/body fluid exposure.

a) Wear plastic aprons or gowns during patient care procedures that are likely to soil clothing with body substances.
b) Wear lab coats in laboratory settings.
c) Remove protective body clothing before leaving the immediate work area.
d) In surgical or autopsy areas, additional protective attire may include surgical caps or hoods and shoes.

2.2.4 Patient placement (Respiratory, Droplet, Contact Precaution)

(Refer to the Isolation precaution reference table)

Private/ isolation rooms are required for infection control for the following groups of patients:

a. Those requiring precautions for airborne diseases.
b. Those who are considered to be severely immunosuppressed.
c. Those where body substances are likely to soil the environment
d. Patients with the same infectious disease/organism may be cohorted (housed in the same room) after consultation with infection control. Team.

2.2.5. Environment

A. Waste Disposal: As per the guidelines of hospital waste management program.

B. Spill management/housekeeping

a) Spills of body substances should be cleaned up promptly. Workers should wear gloves and use other protective equipment if there is risk of spill. Encapsulator products may be used to solidify liquid waste or pickup. The area of the spill should be should then be disinfected with hospital grade disinfectant/detergent.
b) Broken glass will be handled as stated in section2.2.7

c) Areas not routinely cleaned by housekeeping services personnel shall be cleaned by department personnel.

i) Work surfaces shall be cleaned and decontaminated after contact with blood or other potentially infectious materials.

ii) Contaminated surfaces shall be cleaned and decontaminated with an appropriate disinfectant after the completion of procedures; whenever feasible if the surface work area becomes overtly contaminated; or at the end of the work shift. A tuberculocidal disinfectant is required to clean spills of blood or other potentially infectious materials.

d) Broken glassware that may be contaminated will not be directly handled with a gloved or bare hand. It will be handled by mechanical means (tongs, dust pan and broom). Contaminated broken glass will be placed in a puncture-resistant container and disposed of as biohazardous waste.

e) Teeth or bone fragments extracted during surgery (that are to be disposed of) will be considered as sharps and handled as such.

2.2.6. Work practices

Eating, drinking, smoking, applying cosmetics and lip balm and handling contact lenses in any work areas where there is a reasonable likelihood of occupational exposure is prohibited, (e.g. specimens are, at times, temporarily left at a nurse's station.). Prior to the consumption of food or drink, after handling potentially infectious materials, employees will remove potentially contaminated PPE, wash hands, and exit the work area. Food and drink will not be kept in freezers, refrigerators, counter tops, shelves, and cabinets where blood or other potentially infectious materials are stored or handled.

Procedures that could potentially generate aerosols or other inhalation hazards shall be performed in a manner that will minimize pathogen transmission.

Emergency ventilation devices, such as Ambu bags, will be readily available in patient care areas.

2.2.7. Handling and disposal of sharps

A. Sharps disposal is the responsibility of the user of the sharp. Sharps disposal may be delegated only to a person currently present in the room (i.e., never left for another person to dispose off later). The only exception to the delegation policy would be in the surgical suite.

B. Puncture-resistant sharps containers shall be readily available in areas where sharps waste (needle, all syringes, scalpels, glass slides or pipettes, etc.) may be generated.

a) Do not place sharps in the regular bins.
b) Dispose of & sharps as close as possible to the point of use

C. Contaminated needles shall not be recapped or removed from syringes unless the employee can demonstrate that no alternative is feasible and the patient safety is threatened.

a) If recapping is required, then it shall be performed by mechanical means or by a one-handed technique.
b) If needle removal is required, use needle removal device on sharps container or an instrument such as a plastic clamp to distance the hand from the needle. Disposable clamps are available on supply carts.
c) When not piercing the skin of the patient, use needle less systems (for example, when accessing an IV line).

D. Do not overfill sharps containers.

a) Look closely at the sharps container before placing a used sharp inside to be sure that nothing is protruding from the container or that the container is not overfilled.
b) When the sharps container is 2/3 full (to "full" line), close it securely, remove and discard it as biohazardous waste, and replace it with empty sharps container.

E. Do not place needles, introducers, or other sharps on food trays or patient's bed. Do not stick needles into the mattress after use or while performing a procedure.

F. Surgical instruments with sharp edges (e.g. scalpel) should not be passed hand-to-hand but should be placed on a neutral surface (e.g. tray or basin).

G. Reusable sharps:

a) Reusable sharps will be placed in puncture-resistant containers for transport.
b) Reusable sharps that are contaminated with blood or other potentially infectious materials will not be stored or processed in a manner that requires an employee to reach by hand into the container where these sharps have been placed.
c) Containers for reusable sharps will be decontaminated before reuse.
d) Each department that handles reusable sharps will have written procedures for appropriate use. Each department that decontaminates containers will have written procedures in compliance with the policies and procedures of section 4.

H. **SHARPS CONTAINER SAFETY**

a. All sharps containers have to be marked with the biohazard symbol.
b. Whenever possible, have sharps container at every point of use i.e. patient area, treatment room. Avoid walking to container with a used sharp.
c. An open, in-use sharps container should never be kept on the floor, located under a sink or any other poorly visible area.

I. **SHARPS CONTAINER PLACEMENT**

a) Mount and/or secure box whenever possible. Use wire racks, counter holders and other mountings to prevent a loose container from falling over.
b) Mounting of box with holder should be at a level such that the user can easily see into the opening where sharps are to be placed.
c) Sharps containers should be kept away from public areas when at all possible. Public area placement should be limited to only those required for personnel safety and mounted/placed with public safety consideration. Children must be supervised by the adult accompanying them to prevent an accident.

J. Broken glassware that may be contaminated will not be directly handled with a gloved or bare hand. It will be handled by mechanical means (tongs, dust pan and broom). Contaminated broken glass will be placed in a puncture-resistant container and disposed of as biohazardous waste.

K. Teeth or bone fragments extracted during surgery that have to be disposed off will be considered as sharps and handled as such. Dispose off such teeth or bone fragments into a sharps container. Larger bone pieces will be handled in a manner to minimize accidental cutting and will be placed in a biohazard box.

2.2.8. Specimen handling and transport

A. Standard precautions will be used to obtain, transport, and handle all specimens. It is not necessary to label specimens as biohazardous.

B. Specimens of blood or other potentially infectious materials that need to be transported outside the facility will be placed in a well sealed primary container and a secondary plastic bag (zip lock) to prevent leakage during handling, processing, storage, transport or shipping. During transport, gloves are not required because the specimen is already in a secondary plastic bag.

Exception: Within the hospital premises blood specimens in vacutainer tubes may be transported in a tray or a box without a secondary container, provided that the exterior of the tube is not visibly contaminated with blood. If the exterior is visibly soiled, then it will be wiped clean.

C. Specimens in syringes should be capped off (needle removed) before transporting to the laboratory. The exception to this is a fine-needle aspirate.

D. Specimen containers for transport outside the facility will be labeled with the universal biohazard symbol.

2.2.9. Equipment cleaning, transporting and servicing

A. Used equipment will be enclosed in containers or bags to prevent inadvertent exposure to patients or personnel.

B. Equipment that is contaminated with body substances will be cleaned/ decontaminated if possible, prior to transport. If this is not possible, place equipment in containers or bags and label.

C. If equipment cannot be cleaned/ decontaminated, the receiving department or individual will be notified of that contamination so that adequate precautions can be taken.

D. Reusable equipment: cleaning, disinfection and sterilization procedures are covered in section 4 of this manual.

2.3 Special organism precautions (SOP) for Vancomycin Resistant Enterococcus (VRE) / Methicillin Resistant Staphylococcus Aureus (MRSA)

In addition to standard precautions, special organism's precautions (SOP) are initiated and maintained to interrupt the transmission of epidemiologically significant microorganisms known to be spread by contact. These precautions are intended to reduce the colony count of bacteria on horizontal surfaces and in the immediate vicinity of the patient.

2.3.1. Policy

Special organism precautions (SOP) will be instituted on a case-by-case basis at the discretion of the infection control staff and/or medical or nursing staff. Instances in which special organism precautions apply are as follows:

A. When a patient is colonized and/or infected with multiple drug-resistant organisms that are not treatable with the usual antibiotics, i.e., Vancomycin Resistant Enterococcus (VRE), Methicillin Resistant Staphylococcus Aureus (MRSA).

B. When a particular organism is identified as being potentially hazardous because of its antibiogram, pathogenicity, virulence, or epidemiologic characteristics, e.g. rotavirus.

2.3.2. Hand washing

Hand washing, for at least 40-60 seconds with soap or 20- 30 seconds with hand rub, is required:

A. Between patient contacts

B. Following removal of gloves/other protective equipment in the room.

C. Patient also instructed in hand washing and the need for precautions.

2.3.3. Personal protective equipment

A. Wear gloves when contact with the patient's body fluids, discharging wounds, the patient's bedside equipment, and the patient's environment. Change gloves between distinctive tasks (e.g. wound care, perineal care, suctioning). Gloves must always be removed before leaving that patient.

B. Wear a disposable gown for direct contact with the patient or the environment if the patient is incontinent, or has diarrhoea or a draining wound. (Cloth gowns may be substituted if there is no risk of spill).

C. As per standard precautions, wear a mask and protective eyewear when performing procedures that generate aerosols (standard precautions: section 2.2 – infection control manual)

2.3.4. Patient placement

A. Place the patient in a private room/ Isolation room

B. Post the color-coded symbol on or next to the door of the patient's room. "VRE"/ MRSA may not be written on the sign.

C. A negative air pressure in the room is not required. The door may remain open.

D. Patients who are currently on isolation precautions for any infection may not be admitted to the general wards.

2.3.5. Environment

A. Provide the patient with his/her own equipment. The equipment should not be shared (unless it is disinfected properly) between patients. Examples include but are not limited to thermometer, blood pressure cuff, manometer, stethoscope, IV pole, wheelchair, or stretchers. For pediatric patients with VRE or rotavirus that require diaper weighing for Intake and Output measurement, a dedicated scale in the room is required.

B. Nursing staff should use an approved detergent/ disinfectant to wipe down high touch surfaces once a day. At a minimum, this cleaning should include bed rails, over bed table, night stand, as well as the surfaces of electronic equipment, respiratory therapy equipment, and other items that come in physical contact with the patient. In critical care units, or units where there is a high endemic rate of the organism; the wipe down should be repeated during each shift.

C. Quaternary ammonium compound is suitable for the purposes of disinfection. Cleaning cloths used in the room should not be used to clean other patients' rooms and equipment. They should be laundered before reuse or discarded.

D. When the known VRE patient is transferred, please send signage, supplies and patient dedicated equipment with the patient.

E. Upon discharge the room will be cleaned in accordance with the special organism precaution cleaning procedure. Cupboard supplies that have not been opened and are intact may be left in the room for future use.

F. Waste disposal, spill management, linen and food trays are handled in the same way for all patients, regardless of precaution category.(Isolation trays are not required). After patient use, both linen and food trays are sent directly for cleaning and disinfection

2.3.6. Patient transport/ambulation

A. Concerned ward Nurse will notify receiving departments of any patients on special organism precautions.

B. Patients may walk in hall wearing a clean cover gown if they have been instructed in hand washing, are continent, and able to cooperate with procedures.

i. Diapered patients must be supervised when out of the room.

C. For patient transport, the following guidelines apply:

i. Wear gloves only if you are physically moving the patient from the bed .
ii. Wear gloves and a gown only if the patient is incontinent, or has diarrhea or a draining wound.
iii. You must remove the gown and gloves in the room, wash your hands, and then bring the patient to the receiving unit.
iv. After transportation is complete, the gurney or wheelchair must be wiped with a disinfectant.

D. For staff of procedure/diagnostic areas and practices, the following guidelines apply:

a) Hand washing, for at least 40-60 seconds with soap or 20- 30 seconds with hand rub, is required:
   i) Between patient contacts,
   ii) Following removal of gloves/other protective equipment in the room.

b) Personal protective equipment

   i) Wear gloves for all contact with the patient, the patient's bedside equipment, and the patient's environment. Change gloves between distinctive tasks (for example, wound care, perineal care, suctioning). Gloves must always be removed before leaving the room.
   ii) In the patient setting, wear a disposable gown for direct contact with the patient, if the patient is incontinent, or has diarrhea or a draining wound. (Cloth gowns may be substituted if there is no risk of spill).
   iii) As per standard precautions, wear a mask and protective eyewear when performing procedures that generate aerosols (standard precautions: section 2.2 – IC manual)

c). Provide the patient with his or her own equipment. The equipment should not be shared (unless it is disinfected properly) between patients. Examples include but are not limited

to electronic thermometer, blood pressure cuff, manometer, stethoscope, IV pole, wheelchair, or gurney.

d). Decontaminate all the equipment that may have come in contact with patient with the hospital approved detergent.

2.3.7. Visitors/staff

A. Traffic should be limited to only essential staff/visitors.

B. All visitors shall be instructed in proper hand washing technique. Visitors that participate in direct patient care shall be instructed in gowning and gloving, if the patient is incontinent, diapered, or has diarrhea or a draining wound.

C. Visitors may be referred to infection control or given written educational material.

2.3.8. Patient transfer/discharge

For patients being transferred to another facility, Infection Control, discharge planner or physician shall notify the receiving institution whenever possible.

2.3.9. Discontinuation of precautions for a patient with a history of VRE

A. Infection control consultation must be obtained prior to VRE screening for the purpose of discontinuing SOP

B. The screening procedure for VRE is as follows:

a) Obtain a culture from previous VRE (positive) site. If this culture is (-) proceed to the next step.
b) Obtain three perianal swabs, one week apart. Under certain circumstances the usual one-week interval between cultures may be altered with infection control approval.
c) Culture procedure:
    i. Perianal area should be swabbed thoroughly using a sterile swab.
    ii. Write on requisition "screen for VRE" and "infection control approved".
d) When three, consecutive perianal swabs are negative, SOP may be discontinued. If all three perianal swabs cannot be obtained during the same admission, the process can be continued in the outpatient setting or during the patient's next admission. Results from the outpatient setting or another facility must be documented and made available to infection control.

2.3.10 Screening of MRSA is as follows

A. Obtain a culture from previous MRSA positive site. If positive initiate the SOP for special organisms.

B. Also obtain axillary, groin and nasal swabs and if positive initiate local application of mupirocin ointment for a maximum of 7 days.

C. If all are negative for 3 consecutive times, discontinue the protocol.

Section 3: Infection control guidelines for prevention of HAI

3.1 Patient visitors

3.1.1 Policy

A. Visitors with respiratory, skin, or acute gastrointestinal infections should not visit.

B. Visitors, especially children, who have been exposed and may be incubating communicable diseases (e.g., chicken pox, measles, or German measles) should not visit and should not be brought to patient care unit areas such as waiting rooms, playrooms.

C. Visitors should be instructed to use hand washing and other precautions as appropriate to their degree of contact with patient's blood or other body substances.

3.1.2 Responsibilities of nursing staff:

A. Explain necessary precautions and assist visitors with the use of appropriate barriers (e.g., hand washing, mask, and gloves).

B. Screen visitors for active or incubating infections as noted above. This is especially important on pediatric and neonatal units and for patients who are immuno suppressed.

3.2 Guidelines for wound care and prevention of surgical site infections

3.2.1 Introduction

Surgical wound infections present a serious hazard to patients. Local complications include tissue destruction, wound dehiscence, incisional and deep hernias, septic thrombophlebitis, recurrent pain, and disfiguring and disabling scars. Systemic complications include toxemia, bacteremia, shock, metastatic infection, failure of vital organs remote from the infection, and death. The severity of each complication depends largely on the infecting pathogen and on the site of infection. They are the third most frequent nosocomial infection in most hospitals and are an important cause of morbidity, mortality, and incur excessive hospital cost.

In general, a wound can be considered infected if purulent material drains from it, even

without the confirmation of a positive culture. Infected wounds may not yield pathogens by culture because some pathogens are fastidious, culture techniques are inadequate, or the patient has received antimicrobial therapy. On the other hand, infections (for example, those in the granulo cytopenic patient) may not always produce purulent material. Unless the incision is involved, stitch abscesses should not be counted as surgical wound infections; they can be counted as skin or cutaneous infections. The criteria used by CDC to define a surgical wound infection are outlined in section 1.5.2 A

A. Risk factors:

It is important to be aware of the risk factors associated with wound infection so as to apply those prevention measures, which will have the maximum impact.

1. SSI risk factors are based on following considerations of the factors listed below:

a. The patient's wound with contamination or dirt.
b. The patient physical condition.
c. The duration of the procedure.

2. The degree of operative contamination of wounds (according to the traditional wound classification system) is an important risk factor. In general, the more dirty the wound/surgery, the higher the risk of infection.

B. Surgical wound classification

Class I / Clean: An uninfected operative wound in which no inflammation is encountered and the respiratory, alimentary, genital, or urinary tract is not entered. In addition, clean wounds are primarily closed and, if necessary, drained with closed drainage. Operative incisional wounds that follow non penetrating (blunt) trauma are included in this category, if they meet the criteria.

Class II / Clean Contaminated: An operative wound in which the respiratory, alimentary, genital, or urinary tracts are entered under controlled conditions and without unusual

contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided no evidence of infection or major break in technique is encountered.

Class III / Contaminated: Open, fresh, accidental wounds. In addition, operations with major breaks in sterile technique (e.g., open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute, no purulent inflammation is encountered are included in this category.
Class IV / Dirty Infected: Old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This definition suggests that the organisms causing postoperative infection were present in the operative field before the operation.

C. Host Factors

Host factors such as age, presence of perioperative infection, diabetes, nicotine use, steroid use, obesity, extremes of age, extremely poor nutritional status, and perioperative transfusion of certain blood products are also important.

Local wound factors, such as the presence of devitalized tissue or foreign bodies, and poor blood supply to the wound is also significant.

3.2.2. Recommendations

The following recommendations can reduce the risk of surgical site infection.

A. Preoperative

a. Preparation of the patient

i) Whenever possible, 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.

ii) Do not remove hair preoperatively unless the hair at or around the incision site will interfere with the operation.

iii) If hair has to be removed, do so immediately before the operation, preferably with clippers.

iv) Adequately control serum blood glucose levels in all diabetic patients and particularly avoid hyperglycemia perioperatively.

v) Encourage tobacco cessation. At minimum, instruct patients before elective operation to abstain from smoking cigarettes, cigars, pipes, or any other form of tobacco consumption (e.g., chewing/dipping).

vi) Instruct patients to shower or bathe with an antiseptic agent on at least the night before the operative day.

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

viii) Use an appropriate antiseptic agent for skin preparation.

ix) Apply preoperative antiseptic skin preparation agent in concentric circles moving towards the periphery. The prepared area must be large enough to extend the incision or create new incisions or drain sites, if necessary.

b. Hand/forearm antisepsis for surgical team member

i) Keep nails short and do not wear artificial nails.

ii) Clean underneath each fingernail prior to performing the first surgical scrub of the day.

iii) Perform a preoperative surgical scrub for at least 2 to 5 minutes using an appropriate antiseptic. Scrub the hands and forearms up to the elbows.

iv) After performing the surgical scrub, keep hands up and away from the body (elbows in flexed position) so that water runs from the tips of the fingers toward the elbows. Dry hands with a sterile towel and don a sterile gown and gloves.

v) Do not wear hand or arm jewelry.

c. Management of infected or colonized surgical personnel

i) Educate and encourage surgical personnel who have signs and symptoms of a transmissible infectious illness to report conditions promptly to their supervisor and employee health service personnel.

ii) Follow work restriction policies concerning patient-care responsibilities when personnel have potentially transmissible infectious conditions. These policies should govern a) personnel responsibility in using the health service and reporting illness, (b) work restrictions, and (c) clearance to resume work after an illness that required work restriction. The policies also should identify persons who have the authority to remove personnel from duty.

iii) Obtain appropriate cultures from surgical personnel who have draining skin lesions until infection has been ruled out or the personnel has received adequate therapy and infection has resolved. During this period he/ she should be excluded from duty

iv) Do not routinely exclude surgical personnel who are colonized with organisms such as S.*aureus* (nose, hands, or other body site) or group A streptococcus, unless such personnel have been linked epidemiologically to dissemination of the organism in the healthcare setting.

d. Antimicrobial prophylaxis

i) Administer a prophylactic antimicrobial agent only when indicated, and select it based on the basis of its efficacy against the most common pathogens causing SSI for a specific operation and published recommendations.

ii) Administer by the intravenous route the initial dose of prophylactic antimicrobial agent, timed such that a bactericidal concentration of the drug is established in serum and tissues when the incision is made. Maintain therapeutic levels of the agent in serum and tissues throughout the operation and until, at most, a few hours after the incision is closed in the operating room.

iii) Before elective colorectal operations, in addition to the above, mechanically prepare the colon by use of enemas and cathartic agents. Administer non-absorbable oral antimicrobial agents in divided doses on the day before the operation.

iv) Do not routinely use vancomycin for antimicrobial prophylaxis.

B. Intraoperative

a. Ventilation

i) Maintain positive-pressure ventilation in the operating room with respect to the corridors and adjacent areas.

ii) Maintain a minimum of 15 air changes per hour, of which at least 3 should be fresh air.

iii) Filter all recirculated and fresh air through the appropriate filters

iv) Introduce all air at the ceiling and exhaust near the floor.

v) Keep operating room doors closed except when needed for passage of equipment, personnel and the patient.

vi) Limit the number of personnel entering the operating room to necessary personnel.

b. Cleaning and disinfection of environmental surfaces

i) When visible soiling or contamination with blood or other body fluids of surfaces or equipment occurs during an operation, use an approved hospital disinfectant to clean the affected areas before the next operation.

ii) Do not use tacky mats at the entrance to the operating room suite or individual operating rooms for infection control.

iii) Wet vacuum the operating room floor after the last operation of the day or night with an approved hospital disinfectant.

c. Microbiologic sampling

i. Perform microbiologic sampling of operating room environmental surfaces or air only as part of an epidemiologic investigation.

d. Sterilization of surgical instruments

i) Sterilize all surgical instruments according to published guidelines.

ii) Perform flash sterilization only for patient care items that will be used immediately (e.g., to reprocess an inadvertently dropped instrument). Do not use flash sterilization for reasons of convenience, as an alternative to purchasing additional instrument sets, or to save time.

e. Surgical attire and drapes

i) Wear a surgical mask that fully covers the mouth and nose when entering the operating room **where surgical procedure/ operation** is about to begin or already under way, or if sterile instruments are exposed. Wear the mask throughout the operation.

ii) Wear a cap or hood to fully cover hair on the head and face when entering the operating room.

iii) Do not wear shoe covers for the prevention of SSI.

iv) Wear sterile gloves. Put on gloves after donning a sterile gown.

v) Use surgical gowns and drapes that are effective barriers when wet (i.e., materials that resist liquid penetration).

vi) Change scrub suits that are visibly soiled, contaminated, and/or penetrated by blood or other potentially infectious materials

f. Asepsis and surgical technique

i) Adhere to principles of asepsis when placing intravascular devices e.g., central venous catheters, spinal or epidural anesthesia catheters, or when dispensing and administering intravenous drugs.

ii) Assemble sterile equipment and solutions immediately prior to use.

iii) Handle tissue gently, maintain effective hemostasis, minimize devitalized tissue and foreign bodies (i.e., sutures, charred tissues, necrotic debris), and eradicate dead space at the surgical site.

iv) 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 (e.g., Class III and Class IV).

v) 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.

C. Postoperative incision care

a. Protect with a sterile dressing for 24 to 48 hours postoperatively for an incision that has been closed primarily.
b. Wash hands before and after dressing changes or after contact with the surgical site.
c. When an incision dressing must be changed, use sterile technique.
d. Educate the patient and family regarding proper incision care, symptoms of SSI, and the need to report such symptoms.

References:

CDC guideline for prevention of surgical site infection. Infection Control and Hospital Epidemiology, 1999; 20(4): 247-280.

Website: http://www.cdc.gov/ncidod/SSI

3.3 Guidelines for the prevention of catheter-associated urinary tract infections

3.3.1 Introduction

About 40% of nosocomial infections among hospitalized patients in acute care, are urinary tract related. Most of these infections follow instrumentation of the urinary tract, mainly urinary catheterization. Although not all catheter-associated urinary tract infections can be prevented, it is believed that a large number could be avoided by proper management of the indwelling catheter.

The following guidelines pertain to the care of patients with temporary indwelling urethral catheters. Patients who require long-term indwelling catheters or individuals who can be managed with intermittent catheterization may have different needs and require separate consideration.

3.3.2 Recommendations

A. Catheter Use

a. Urinary catheters should be inserted only when necessary and left in place for as short as necessary. They should not be used solely for the convenience of patient-care personnel.
b. For selected patients, other methods of urinary drainage such as condom catheter drainage or suprapubic catheterization can be useful alternatives for indwelling urethral catheterization.
c. The silver and hydrogel-coated Foley catheter is recommended to reduce the risk of urinary tract infections.

B. Catheter Insertion

a. Thoroughly wash hands or use antimicrobial hand gel before inserting the catheter.
b. Catheters should be inserted using aseptic technique and sterile gloves and equipment.
c. Gloves, drapes, sponges, an appropriate antiseptic solution for periurethral cleansing, and a single-use packet of lubricant jelly should be used for insertion.
d. A small catheter, consistent with good drainage, should be used to minimize urethral trauma.

e. Indwelling catheters should be properly secured after insertion to prevent movement and urethral traction.

C. Closed sterile drainage

a. A sterile, continuous, closed drainage system should be maintained.
b. The catheter and the drainage tubing should not be disconnected unless the catheter has to be irrigated.
c. In case of breaks in aseptic technique, disconnection, or leakage occur, the collecting system should be replaced using aseptic technique after disinfecting the catheter-tubing junction.

D. Irrigation

a. Irrigation should be avoided unless obstruction is anticipated (e.g., as might occur with bleeding after prostatic or bladder surgery). Closed continuous irrigation may be used to prevent obstruction.
b. Intermittent irrigation should only be used to relieve obstruction due to clots, mucus, or other causes. A large-volume sterile syringe and sterile irrigant should be used and then discarded. Aseptic technique should be used. The catheter-tubing junction should be disinfected before disconnection.
c. The catheter should be changed if it is likely that the catheter is contributing to the obstruction (e.g., formation of concretions).

E Specimen collection

a. Small volumes of fresh urine for examination can be obtained from the sampling port. The port should be disinfected and urine aspirated with a sterile needle and syringe or any other collection device (e.g. vacutainer).
b. Larger volumes of urine for special analyses should be obtained aseptically from the drainage bag.

F. Urinary flow

a. Unobstructed flow should be maintained. Occasionally, it is necessary to temporarily obstruct the catheter for specimen collection or bladder training)

b. To achieve free flow of urine:

i) The catheter and drainage tube should be kept from kinking.

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

iii) Poorly functioning catheters should be replaced.

iv) Collecting bags should always be kept below the level of the bladder. Never place the drainage bag in a place that can contaminate it, (e.g., the floor.)

G. Perineal care

Special meatal care is not required. Daily cleansing of the perineal area with soap and water is an important part of the hygiene for all patients. Do not use powder because it will dry the meatus. Clean catheter-meatal junction after every incontinent stool.

H. Other Issues

a) Urine measuring devices and specific gravity manometers should be rinsed well after each use and dried before storing & labeled with the patient's name and room number (for individual patient use.)

b) Avoid changing the indwelling catheter unnecessarily. If the catheter is draining well, leave it in place. Removal of the catheter will not remove organisms from the bladder. Never culture the catheter tip when the catheter

is removed as it does not predict organisms causing the UTI and may lead to unnecessary treatment.

c) Change the drainage bag when you insert a new catheter. Also change the drainage bag when it becomes stained, clouded by sediment, or leaks.

d) Encourage fluids within limits the patient can medically tolerate. Flush the urinary system from the inside out, the so-called "natural flush." Normal fluid intake should be around 2000 ml daily.

Reference:

CDC guidelines for prevention of catheter associated urinary tract infections

3.4 Guidelines for prevention of intravenous therapy-related infections

3.4.1Introduction:

The intravenous (IV) cannula offers direct access to a patient's vascular system and provides a potential route for entry of microorganisms into that system. These organisms can cause serious infection if they are allowed to enter and proliferate in the IV cannula, insertion site, or IV fluid.

IV therapy-related bacteremia is a potential cause of serious illness or death for patients. Additional cannula-related complications which can occur with or without fever or bacteremia include the following.

Phlebitis: Warm, erythematous skin over an indurated or tender vein and often precedes or is associated with more severe infections.

Occult IV-Site Infection: It does not produce much (if any) pus or inflammation at the IV site. This is the most common cannula-related infection, may be the most difficult to identify, and is probably associated with more bacteremias than cellulitis or purulent thrombophlebitis.

Cellulitis: Warm, erythematous, and often tender skin surrounding the site of cannula insertion; pus is rarely detectable.

Purulent thrombophlebitis: Warm, erythematous skin over an indurated or tender vein with purulent drainage from the cannula wound. Pus may drain spontaneously or be expressed with pressure. This infection is dangerous and frequently leads to bacteremia.

3.4.2. Recommendations

A. Ensure body substance isolation compliance (see infection control manual, section 3) Gloves must be worn for all vascular procedures.

B. Indications for use: intravenous (IV) therapy should be used only for definite therapeutic or diagnostic indications.

C. Choice of cannulas

a. Plastic or stainless steel cannulas may be used for routine peripheral IV infusions.

b. For central lines, cannulas with the least number of lumens consistent with the therapeutic needs of the patient should be used, due to the higher risk of infection associated with multi-lumen cannulas. A multi-lumen cannula should be replaced by single-lumen canula as soon as the patient's condition allows or certain devices like clave connectors can be used for the lumens.

c. Peripherally inserted catheters should be used for long term IV therapy (usually longer than 14 days). Sterile technique must be used during insertion.

D. Choice of site

a. In adults, an upper extremity site (or if necessary, subclavian and jugular sites) should be used in preference to a lower extremity site for IV cannulation. All cannulas inserted into lower extremity should be changed as soon as a satisfactory site can be established elsewhere.

b. Cannulas inserted under emergency condition and with less than optimal asepsis should be changed as soon as the patient's condition stabilizes and a satisfactory site can be established elsewhere.

E. Site preparation

a. The IV site should be scrubbed with an antiseptic prior to venipuncture.

b. Alcohol (70%), iodophors, or chlorhexidine can be used. The antiseptic should be applied liberally, with friction, and allowed to remain in contact with the skin for a minimum of 30 seconds prior to venipuncture.

F. Procedures accompanying insertion

a. A sterile gauze or transparent dressing should be applied to cover the insertion site.

b. The cannula should be secured to stabilize it at the insertion site.

c. Date of insertion should be recorded in the medical record, and on the dressing or tape.

G. Maintenance of IV site

a. Patients with intravenous devices should be evaluated at least daily for evidence of cannula-related complications. This evaluation should include gentle palpation of the insertion site through intact dressing. If a transparent dressing is used, a visual inspection of the site should accompany palpation. If the patient has an un-explained fever or there is pain or tenderness at the insertion site, the dressing should be removed and the site inspected.

b. Peripheral site dressings may remain in place for 72 hours unless they become moist or soiled or must be removed for other reasons.

c. Central line dressing should be changed when the dressing becomes moist or soiled and should be changed at least twice a week. This applies to PIC catheters as well.

H. Removal and replacement of a cannula

a. Peripheral cannula site, including heparin-lock devices, should be changed every 72 hours.

b. If for any reason a peripheral cannula cannot be removed and replaced after it has been in place for 72 hours, the patient's physician should be notified and the physician should document the indications for prolonged cannulation of a pe-

ripheral vein. If the need for vascular access remains and other peripheral sites are not available, a central cannula may be indicated.

c. Central cannulas should be removed when cannula associated infection (local or systemic) is suspected.

I. Special procedures for central cannulas (those whose tips lie in the large central vessels or are threaded into or through the chambers of the heart)

a. Central cannulas should be inserted with aseptic technique and sterile equipment. Sterile gloves and drapes should be used to achieve this objective. A mask and cap should also be worn.

b. Central cannulas should be removed when they are no longer medically indicated or if they are suspected of causing sepsis.

c. Central cannulas that are inserted through a subclavian or jugular approach need not have the site routinely changed. If prolonged cannulation at a single site is indicated, cannulas may be changed over a guide wire. This is appropriate when there is a change in the number of lumens required.

d. Central cannulas that are inserted through a peripheral site pose a greater risk of cannula-related infection and should be monitored closely and removed at any sign of infection (local or systemic).

J. Maintenance of administration sets

a. For adult patients, IV administration tubing, including "piggyback" tubing, extension tubing, CVP manometers, infusion pump tubing; and pressure monitoring tubing and transducer (for any site) should be changed every 72 hours.

b. For neonates and pediatric patients, IV administration tubing, including "piggyback" tubing, extension tubing, infusion pump tubing; pressure monitoring tubing and transducer (for any site) should be changed every 48 hours.

c. Tubing for hyper alimentation should be changed every 48-72 hours.

d. Tubing should be changed after the administration of blood, blood products, or lipid emulsions.

e. Between changes of components, the IV system should be maintained as a closed system. All entries into the tubing, as for administration of medication, should be made through injection ports that are disinfected with 70% alcohol just prior to entry.

f. Irrigation of the system to improve flow should be avoided.

g. Blood specimen withdrawal through IV administration tubing, except in an emergency or when immediate discontinuation of the cannula and tubing is planned, is not recommended.

K. Actions for infection or phlebitis

a. For purulent thrombophlebitis, cellulitis, or IV-related bacteremia, the entire IV system (cannula, administration set and fluid) should be changed.

b. For phlebitis without signs of infection, the cannula should be changed

L. Culturing for suspected IV-related infections

a. If an IV system is to be discontinued because of suspected IV-related bacteremia/ sepsis, the skin at the skin-cannula junction should be cleaned with alcohol and the alcohol is allowed to dry before cannula removal. The cannula tip should be sent for culture using semi-quantitative technique. Send **5 inches** of the cannula tip, cut with sterile scissors, in a dry specimen container. Do not place tip in culture media of any kind.

b. Blood cultures (2 sets) should be obtained in conjunction with a cannula tip culture. Whenever possible, blood cultures should not be obtained through the cannula suspected to be related to infection.

c. Cannula entry site cultures are not recommended because they are a poor predictor of the organism responsible for cannula related sepsis

d. If an IV system is discontinued because of suspected fluid contamination, the fluid should be cultured and the implicated container (bottle or bag) saved in the unit's specimen refrigerator.

e. If contamination of fluid is confirmed, the implicated container and the remaining units of the implicated lot should be saved, and the lot number of fluid and additives should be recorded. Notify infection control and pharmacy.

References:

Centers for Disease Control. Guidelines for the prevention of intravenous therapy-related infections. HICPAC, 1995

3.5 Guidelines for the prevention of nosocomial pneumonia

3.5.1 Introduction

Pneumonia is the second most common nosocomial infection reported in the world and is associated with substantial morbidity and mortality. Most patients with nosocomial pneumonia are those with extremes of age, severe underlying disease, immunosuppression, depressed sensorium, and cardiopulmonary disease, and those who have had thoraco-abdominal surgery. Although patients with mechanically assisted ventilation do not comprise a major proportion of patients with nosocomial pneumonia, they have the highest risk of developing the infection.

Most bacterial nosocomial pneumonias occur by aspiration of bacteria colonizing the oropharynx or upper gastrointestinal tract of the patient. Intubation and mechanical ventilation greatly increase the risk of nosocomial bacterial pneumonia because they alter first-line patient defenses. Pneumonias due to *Legionella* spp., *Aspergillus* spp., and influenza virus are often caused by inhalation of contaminated aerosols. Respiratory syncytial virus (RSV) infection usually follows viral inoculation of the conjunctivae or nasal mucosa by contaminated hands.

Traditional preventive measures for nosocomial pneumonia include decreasing aspiration by the patient, preventing cross-contamination or colonization via hands of personnel, appropriate disinfection or sterilization of respiratory therapy devices, use of available vaccines to protect against particular infections, and education of hospital staff and patients.

The following guidelines are based on recommendations from the Centers for Disease Control.

3.5.2 Recommendations

A Compliance with standard precautions (section 2.2 –IC manual) e.g., hand wPNHing, PPE.

B. Perioperative measures for prevention of postoperative pneumonia

a. Patients at risk [see above] should receive pre-and postoperative instruction and therapy designed to prevent postoperative pulmonary complications such as pneumonia.
b. Pain that interferes with coughing and deep breathing should be controlled.
c. Systemic antibiotics should not be routinely used to prevent postoperative pneumonia.

C. Fluids and medications

a. Only sterile fluids, dispensed aseptically, should be nebulized or used in a humidifier.
b. If multi-dose vials of medication are used, they should be stored according to the manufacturer's directions, dispensed aseptically, and not used for longer than the expiration date on the vial.

D. Maintenance of In-use respiratory therapy equipment

a. Fluid reservoirs should be filled immediately before use. Fluid should not be added to replenish partially filled reservoirs. Residual fluid should be discarded and the reservoir filled with fresh fluid.
b. Water that has condensed in tubing should be discarded and not allowed to drain back into the reservoir.
c. Disposable nebulizers, breathing circuits for IPPB and hand-held nebulizers should be replaced every 24 hours.
d. Disposable humidifiers for use with wall oxygen should be replaced when depleted.

e. Disposable supplies such as nasal prongs, tubing, masks, ventilator and breathing circuits are for single patient use only.
f. Ventilator circuits and accompanying valves and probes should be changed and replaced when contaminated or when there is mechanical fault.
g. When a respiratory therapy machine is used to treat multiple patients, the breathing circuit must be changed between patients.
h. Heat moisture exchangers to be changed every 48 hours or when contaminated.

E. Anesthesia machines, and breathing systems or patient circuits

Cleaned and then sterilized or subjected to high-level 'liquid' chemical disinfection or pasteurization. The reusable components of the breathing system or patient circuit need to be (e.g., tracheal tube or face mask; inspiratory and expiratory breathing tubing; y-piece; reservoir bag; humidifier and tubing) between uses on different patients, by following the device manufacturer's instructions for their reprocessing.

F. Pulmonary-function testing equipment

Sterilize or subject to high-level liquid chemical disinfection or pasteurization and clean the reusable mouthpieces and tubings or connectors between uses on different patients, by following device manufacturer's instructions for their reprocessing.

G. Processing reusable equipment

a. All equipment to be sterilized or disinfected should be thoroughly cleaned first to remove organic material such as blood, secretions, or other residue.
b. Respiratory therapy equipment that touches mucous membranes or that is a non-disposable part of the breathing circuit should receive high-level disinfection or be sterilized.
c. Coolant chambers for ultrasonic nebulizers are difficult to disinfect adequately and should have at least 30 minutes contact with a high-level disinfectant or be gas-sterilized (ethylene oxide). This is not necessary if a disposable chamber is used.

d. Respirometers and other equipment used to monitor several patients in succession should not directly touch parts of the breathing circuit. Extension pieces should be used between the equipment and the breathing circuit and should be changed between patients. If no extension piece is used, the monitoring equipment must be considered contaminated and subjected to high-level disinfection or sterilization before use on other patients.

e. Hand-powered resuscitation bags that have been used for a patient should receive high-level disinfection or be sterilized (unless disposable).

H. Patients with tracheostomy.

a. Tracheostomy should be performed under aseptic conditions in an operating room, except when clinical indications for emergency bedside tracheostomy intervene.

b. Tracheostomy care requires clean technique (unless otherwise ordered) with both hands gloved. Use sterile water instead of tap water.

I. Suctioning of the respiratory tract

a. Risk of cross-contamination and excessive trauma increases with frequent suctioning. Suctioning should not be done routinely but only when needed to reduce substantial secretions.

b. Suctioning should be performed using gloves on both hands. Use of protective eyewear and mask is strongly encouraged.

c. A sterile catheter should be used for each series of suctioning (defined as a single suctioning or repeated suctioning done with only brief periods intervening to flush the catheter).

d. If flushing of the catheter is required, sterile fluid should be used. Fluid that is contaminated by use for one series of suctioning should be discarded.

e. Suction connecting tubing and suction canisters should be changed between patients.

f. Unless disposable, suction canisters should be thoroughly cleaned to remove organic material, then receive high-level disinfection or be sterilized.

J. Bacterial pneumonia

a. Educate healthcare workers regarding nosocomial bacterial pneumonias and infection control procedures to prevent their occurrence.

b. Conduct surveillance for bacterial pneumonia among ICU patients who are at high risk for nosocomial bacterial pneumonia (e.g., patients with mechanically assisted ventilation to determine trends and identify potential problems). Include data regarding the causative microorganisms and their antimicrobial susceptibility patterns. Express data as rates (e.g., number of infected patients or infections per 100 ICU days or per 1,000 ventilator-days) to facilitate intra-hospital comparisons and determine trends.

c. Do not *routinely* perform surveillance cultures of patients or of equipment or devices used for respiratory therapy, pulmonary-function testing, or delivery of inhalation anesthesia.

K. Prevention of aspiration associated with enteral feeding

a. If there is no contraindication to the maneuver, elevate (an angle of 30-45 degrees) the head of the bed at high risk of aspiration pneumonia e.g., person receiving mechanically assisted ventilation and/or has an enteral tube in place.

b. Routinely verify appropriate placement of the feeding tube.

c. Routinely assess the patient's intestinal motility (e.g., by auscultating for bowel sounds and measuring residual gastric volume or abdominal girth) and adjust the rate and volume of enteral feeding to avoid regurgitation.

L. Other prophylactic procedures for pneumonia

Recommend vaccination of patients at high risk for complications of pneumococcal infections with pneumococcal polysaccharide vaccine. High-risk patients include persons greater than 65 years old; adults with chronic cardiovascular or pulmonary disease, diabetes mellitus, alcoholism, cirrhosis, or cerebrospinal fluid leaks and children and adults with immunosuppression, functional or anatomic asplenia, or HIV infection.

3.6 Guidelines for use of multiple-dose medication vials (MDV)

Single-dose vials are preferable to multiple-dose vials. When the use of multiple-dose medications is considered necessary, it is important to take the following precautions against contamination of that medication:

A. Store the medication under the conditions recommended by the manufacturer and/or the pharmacy service.
B. Before use, inspect the container for integrity of packaging and inspect solution for visible contamination.
C. Before each needle puncture of rubber diaphragms, thoroughly disinfect the surface with isopropyl alcohol
D. With each withdrawal of medication, maintain strict aseptic technique (new sterile needle and syringe) to avoid contaminating the remaining medication.
E. **MDVs should be discarded when contaminated (user has knowingly contaminated the MDV or solution has visual evidence of contamination) or 30 days from the date of opening**.

3.7 Waste management

Waste materials should be handled, contained, and disposed of according to Hospital Waste Management Policy. The following guidelines provide specific definitions of and disposal methods for Nonmedical, Medical/Biohazardous (previously designated as "infectious") and Sharps wastes.

3.7.1 Guidelines for waste management

S. NO	Category	Description	Color coding	Treatment and Disposal
1	Human anatomical	Human tissue, amputated body parts	Yellow	Incineration
2	Infectious solid waste	Items contaminated with blood and body fluid, blood	Yellow	Incineration

		samples etc		
3	Microbiology waste	Culture plates, stock cultures etc	Yellow	Autoclaving
4	Disposables	Plastic contaminated disposables other than sharps(all used IV bottles must be punctured to prevent reuse)	Red	Autoclaving
5	Sharps	Needles, scalpels, blades, broken glass	Sharp containers	Autoclaving and shredding
6	Liquid waste	Waste from housekeeping, cleaning and disinfection activities	Not required	Sewage Treatment
7.	Chemical waste	Chemicals used for disinfection etc	Not required	Sewage Treatment
8.	Discarded medicines	Expired, outdated, spurious medicines	Yellow	Incineration
9	Incineration PNH	End product of incineration	Black	Landfill
10	Non infectious waste	Office waste like paper, packaging material etc	Black	Direct disposal
11	Kitchen waste	Waste food	Black	Direct disposal

12	Radioactive waste	Radio-isotopes	Lead containers	BARC guidelines
13	Glass	Unbroken bottles	White	Disposal

Section 4: guidelines for sterilization, disinfection, and cleaning

4.1 Processing, storage and distribution of supplies and equipment

Following are the list of policies and procedures developed and implemented by the Sterile Processing Department of Material Services to provide safe decontamination, sterilization, disinfection, storage and distribution, as well as monitoring of these activities. They include:

1. Receiving, decontaminating, cleaning, preparing, and disinfecting procedures;
2. Assembly, wrapping, storage, distribution and quality control of sterile equipment and medical supplies;
3. Use of sterilization process monitoring, including: temperature, pressure, chemical and live spore tests;
4. Packaging, storage and distribution safety;
5. Shelf-life standards for in-house processed items and for commercially prepared articles/items, including those not designated with an expiration date;
6. Preventative maintenance of all processing equipment;
7. Recall and reprocessing or disposal of outdated items;
8. Emergency notification and disposition of items or supplies when warnings have been issued by the manufacturer or a government agency, or when an internal recall is needed due to possible processing failure;

9. Mechanism for timely reporting to infection control department, attending physician and hospital risk management of any emergency collection of possible contaminated or hazardous items.

Workflow, traffic and worker education provide for the separation of soiled and contaminated supplies from those, which are clean and sterile.

Processing staff is educated on the above policies and procedures, and how to perform these functions with safe work practices and appropriate Personal protective equipment, in order to prevent exposure to pathogens and protect patients from nosocomial infection. All the above policies and procedures are available in the CSSD policy and procedure manual.

4.2 Sterilization, disinfection and antisepsis defining terms

Cleaning:

Physical removal of organic matter to reduce microbial growth prior to killing the microbes. Organic material can interfere with the action of antiseptics, disinfectants, and sterilants, and prevent adequate penetration. Soap and water with friction is still standard. Cleaning must precede disinfection/ sterilization.

Sterilization:

Removal or destruction of all microorganisms and their spores. All items that enter sterile tissue or vascular system must be sterile, i.e. implants, scalpels, needles, surgical instruments, etc. (Critical items)

Disinfection:

Reduction in number and type of microorganisms –

High-level disinfection includes pasteurization or use of gluteraldehyde. All life is destroyed except spores. Items (except dental) that touch mucous membranes should receive high-level disinfection i.e. flexible endoscopes, laryngoscopes and other similar instruments. (Semi-critical items)

Intermediate - level hospital-grade disinfectant – hospital approved Tuberculocidal cleaner/disinfectant. Items that touch mucous membranes or skin that is not intact should receive intermediate-level disinfection i.e. thermometers, hydrotherapy tanks.

Low-level sanitizers: They reduce bacteria to a "safe level". Items that touch intact skin should receive low-level disinfection, i.e.stethoscopes, beds, whirlpools, and equipment, which are non-invasive to patients. (Non-critical items)

Antisepsis:

Inhibition of microorganism's growth on living tissue such as skin preparation before vascular line insertion or other invasive procedure. Alcohol, chlorhexidine, and iodophors, i.e., betadine are most frequently used solution for antisepsis.

Germicidal chemicals used for antisepsis are not generally adequate for decontaminating environmental surfaces.

Note: Always follow manufacturer's instructions when preparing/ using disinfectants as written on the label - do not place disinfectants in secondary or unlabeled containers.

4.3 Agents available for disinfection and antisepsis

a. Skin preparation

Non-mucosal surfaces	70% alcohol, chlorhexidine or Iodophor solution
Mucosal surfaces	Iodophor
Foley catheter insertion	Iodophor, chlorhexidine
Routine catheter care	Perineal care with soap & water.Meatal Care with Normal Saline
Vascular catheter insertion	Chlorhexidine or iodophor solution
Vascular site care	Alcohol, chlorhexidine or Iodophor
Handwashing	Hand rubs (Alcohol / chlorhexidine based) ,Lotion soap for routine washing

	Antimicrobial, such as Iodophor (scrub) or Chlorhexidine, for invasive procedures

b. Inanimate objects

Instruments - patient equipment	Soiled items will be sent to sterile processing for cleaning and processing with prior cleaning in the area of use. Instrument sets in the operating room are sprayed with a mixture of enzyme solution/water cleaned and packed prior being sent to sterile processing.
Non-patient items such as IV pumps, etc.	Return to sterile processing for cleaning.
Patient tubs, sitz baths, etc.	Clean with chlorine bleach powder (cleanser) after use.

Note: Please dispose of all sharps in proper receptacle prior to transporting any used patient equipment to sterile processing. Please empty any liquids from container into sanitary system prior to transport of bowls, etc. to sterile processing.

4.4 Methods of assuring adequate processing of inanimate objects in the hospital environment

4.4.1 Patient-care objects

A Critical Items: Those item that contact sterile tissue or the vascular system, or blood will

flow through them. Items should be sterilized before each use. Item should be free of any microorganisms including bacterial spores.

a. Sterilized in the hospital

i) Example: Surgical instruments and devices; angiography catheters, urinary catheters, and implants (e.g. heart valve)

ii) Method: Shelf life for all items sterilized in the hospital is event related. Inspect package for breaches of integrity to assure sterility before use. Follow manufacturer's instructions for each sterilizer or use recommended protocol. Sterilizer must be tested on a regular basis using acceptable biological indicators.

iii) Comment: Sterilization processes are designed to have a wide margin of safety. If spores are not killed, the sterilizer should be checked for proper use and function; if spore tests remain positive, discontinue use of the sterilizer and have it serviced. Notify infection control (section 4.7 – IC manual)

b. Purchased as sterile

i) Example: Intravenous fluids; needles; syringes

ii) Method: Use before expiration date. Inspect package for integrity before use. Culture only if clinical circumstances suggest use of the item.

iii) Comment: Notify the materials dept /administration if factory-related (intrinsic) contamination is suspected.

B. Semi-critical items: Items that contact mucous membranes and non-intact skin. They should be free of most vegetative bacteria and at a minimum, shall receive high-level disinfection.

i) Example: Respiratory therapy equipment and instruments for gastrointestinal endoscopy, which will touch mucous membranes, except dental.

ii) Method: Follow a protocol for high-level liquid chemical disinfection or pasteurization. Chemical or mechanical monitoring will be used to test the efficacy of these processes.

iii) Comment: These devices come in contact with mucous membranes. Resistant spores can remain after liquid chemical disinfection, but these are not usually pathogenic.

C. Non-critical items: Items that come in contact with intact skin.

i) Example: Bedpans; crutches; bed rails; water glasses; linens; bedside tables; blood pressure cuffs. Hydrotherapy units used on intact skin.

ii) Method: Follow standard protocol for cleaning using cleaning disinfectant.

iii) Comment: These items will not usually come in contact with open skin or mucous membranes.

4.4.2 Non-patient-care objects

Adequate processing of non-patient-care objects is primarily aimed at protecting personnel and others who come in contact with these objects; sterility is not critical.
a. Likely to be contaminated with virulent microorganisms

i) Example: Bench surfaces of laboratories handling patient specimens

ii) Method: Follow a standard protocol for cleaning, using a cleaning disinfectant

iii) Comment: Areas handling blood or microbiologic specimens are most important. For large volume spills, use encapsulater and call HAZMAT team

b. Unlikely to be contaminated with virulent microorganisms

i) Example: Areas not involved in patient care: offices, storage areas

ii) Method: Perform routine cleaning

iii) Comment: Cleaning is aimed mainly at improving the appearance of and providing a proper atmosphere in which to work as well as removing soil.

All items undergoing high-level disinfection and sterilization must first be thoroughly cleaned to remove all organic matter and residue.

4.4.3. Process selection

A.There are a number of principles that should be considered when selecting a process for sterilization or high-level disinfection of critical and semi-critical items. These principles include:

a) Choose a process appropriate to the level of risk for infection (e.g. critical, semi-critical, etc.) with the highest margin of safety.
b) Choose the process most compatible with the materials to be processed.
c) Choose the process least toxic to health care workers involved in processing.
d) Choose the process that is the fastest.
e) Choose the process that is the most cost effective.

B. Triage into critical, semi-critical, or non-critical as per the definition above.

C. Triage Critical items into "heat and moisture stable" or "heat and moisture sensitive" and select the appropriate process.

a. If heat and moisture stable, use steam sterilization.
   i. High vacuum wrapped preferred
   ii. If not feasible then wrapped gravity preferred.

b. If heat and moisture sensitive, triage into "immersible" and "non-immersible"
   i. Select process for immersible products
   ii. Select process for non-immersible products (including ETO).

D. Triage semi-critical items into "immersible" or "non-immersible" (Note: In some cases if the item is heat and moisture stable, steam autoclaving may be the most economic, expedient, and least toxic) option

a. Select the process for immersible products.
b. Select the process for non-immersible and partially immersible products (including ETO).

Reference:

CDC: Olmstead RN et al. APIC Infection Control and Applied Epidemiology 2001

4.5 Thermometers

Disposable thermometer sheaths will be used for measuring patient temperatures. Hands should be washed between each patient temperature measurement, no matter which technique is used.

For electronic, intermittent thermometers, the following procedure should be followed:

A. When possible, each patient should be provided with his/her own thermometer. A new probe cover is used for each patient.
B. Electronic thermometers are to be cleaned/ disinfected in between patient use by the user. This includes the probe, the cord and the body.
C. A hospital approved disinfectant, should be used.

D. Environmental contamination is a particular concern whenever rectal probes are used. Do not mix oral and rectal thermometers at any stage of processing.

4.6 Guidelines for sterilization/disinfection of scopes

Semi-critical items such as endoscopes will be either high-level disinfected or sterilized using ethylene oxide. High-level disinfection is expected to destroy all microorganisms, with the exception of bacterial spores. The following steps need to be followed:

A. Adequate physical cleaning of both interior and exterior surfaces with standard instrument cleaning solution as well as friction should be followed by the use of an enzymatic agent to break down organic material, which may inactivate the disinfectant.
B. Soak in glutaraldehyde (2%) for a minimum of 20 minutes, followed by suctioning up solution through both biopsy channel and valve housing for a minimum of 30 seconds. Either tap water followed by alcohol and air drying or sterile water and a clean dry environment. Do not use the case provided by the manufacturer for storage. Storage areas should be cleaned on a regular basis. Alternatively use Cidex OPA.
C. Other equipment used in procedures such, as instruments, brushes, etc., should be processed in sterile processing using steam sterilization. As biopsy forceps or cutting instruments are used to penetrate the mucosal barrier, they should be sterilized and not just disinfected at high-level.
D. Please refer to the departmental policy for more specific information on care of a particular instrument.
E. Health care worker precautions - Refer to body substance isolation section 2.2 (IC manual) or appropriate work practices and personal protective equipment use for handling equipment and during processing steps to prevent employee

exposure to body substances. Staff is strongly recommended to be immunized for Hepatitis B.

4.7 Biological monitoring of sterilizers

A. All sterilizers should be monitored at least once a week with commercial preparations of spores intended specifically for that type of sterilizer (i.e., *Bacillus stearothermophilus* or a bacterial enzyme indicator for steam sterilizers and *Bacillus subtilis* for ethylene oxide and dry heat sterilizers).

B Every load that contains implantable or intravascular objects or any direct patient use item should be monitored. Each of these loads will be monitored by the use of the chemical indicator and biological system.

C 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.

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

E Flash sterilizers are monitored with a live spore and the use of the indicator system in every load.

F If the biological monitoring results are positive, corrective action will be taken.

G The date and time of release will be documented in the sterilization log by the operating staff.

4.8 Chemical monitoring of disinfectants

A. Semi-critical items/instruments will be appropriately disinfected using high-level chemical disinfectants and recorded.

B. Chemical liquid disinfecting solutions will be tested daily before use and results documented on the chemical test strip log .The documents will be retained for a defined period of time.

C Both the gluteraldehyde record and the gluteraldehyde test strip log shall be kept on file for a minimum of 6 months.

4.9 Shelf life for sterilized items

4.9.1 **Policy**

The shelf life of all sterile items is event related. The integrity of the packaging will determine whether or not the enclosed item can be considered sterile. Breach of integrity includes: wet, torn or punctured wrappers and peel pouches, ruptured seals and closures, missing sterilization locks or load stamps or other visible signs of damage to the sterilization container or wrapper. Since the probability of the occurrence of a contamination event increases with time, stock rotation will be adhered to.

This is a hospital wide policy, affecting all departments, clinics and doctor's offices storing sterile patient items.

4.9.2 **Objective**

To provide a scientifically and economically sound shelf life policy that assures maximum patient safety.

4.9.3 **Procedure**

The shelf life policy has several important components:

A. Sterile packaging, wrapping and labeling:

a) The only approved sterile packaging methods are:

i) Rigid containers (shelf life of one year)

ii) Paper-plastic and Tyvek peel pouches (light weight instruments, tip protectors will be placed on all sharp and pointed items.)

iii) Non- woven polypropylene double thickness wraps

iv) Dust covers, or two peel pouches should be used if the sterile item is transported over long distances, or has a turn around time greater than three months.

b) All sterile products must be labeled as follows:

i) Attach a load sticker providing the sterilization date as well as the lot control number to the wrap of the sterile item.

ii) The technician responsible for processing the sterile items will place his initials on the outside of the package.

iii) Affix a caution label stating: "sterile unless opened, damaged or wet" to the outside of the sterile product.

iv) Sterile items not subjected to event-related shelf life will be labeled with an expiration date. (For example items that do not meet the wrapping materials criteria for event related expiration, or items with manufacturer recommended expiration dates)

B. **Storage, Handling and Transport**

a) The integrity of the packaging material (wrap, peel pouch, container) must be verified prior to the release and prior to the use of sterile items. Any sterile package that shows evidence of breach of integrity will be considered unsterile. It must be returned to the sterile processing department.

b) All departments or clinics storing sterile patient items must inspect their stock for evidence of tampering, punctures, moisture or other signs of compromised packaging. Such inspections will be scheduled at three-month intervals. Documentation of such inspections will be maintained by the departments and must also be forwarded to the

sterile processing manager. A summary of the inspection should be reported to the infection control committee on an annual basis.

c) The persons responsible for handling, storage, cleaning and inspection of sterile supplies should receive training to include the following; time related vs. event related shelf life, inspecting the condition of sterile packages, handling transportation and storage of sterile supplies, consequences of using unsterile supplies, stock rotation and consequences of excessive dust on outside wrapping. A training guide can be obtained from the materiel services department. Users of sterile supplies should also be educated to inspect all products prior to use.

d) All sterile items will be rotated so that the oldest stock is used first. (This responsibility falls to the department owning the stock)

e). All sterile patient items require storage in the following manner:

i) 10" away from the floor
ii) At least 18" from the ceiling
iii) At least 2" from the outside walls
iv) Away from potential moisture contamination (sinks, steam pipes etc)
v) Packages should be positioned in a way that avoids crushing, bending or compression.
vi) It is recommended that the sterile items be stored in cabinets or closed containers.

f). Sterile supplies should be transported to off-site buildings in covered carts, while items transported within the facility should be protected by a plastic cover.

Reference:

"AAMI, Standards and Recommended Practices" 5.7.4, 5.10.1, 2.5.4, 5.1.2.5, 7.2.3 "AORN" Recommended Practices XI, XII "JCAHO: Written Policies for Shelf Life" I.C. 5.1.2

Section 5: Employee Health

5.1Human resource department will formulate policies on vaccinations of staff recruitment.

5.1.2 **Hepatitis B vaccine program**

A. **Vaccine offered/potential exposure**

All employees whose jobs involve tasks with potential exposure to blood borne pathogens shall be offered the vaccine series. Any person who, at the time of recruitment claims to be fully vaccinated against HBV, shall have to submit the supportive evidence in the form of anti HBs titers.

B. **Contractual staff**

All contract workers shall be vaccinated against HBV before being assigned any work in the hospital. A list of all such workers working any where in the hospital at a given time shall be available with the personnel department.

C. **Pre-vaccination screening**

Generally pre-vaccination screening is not offered, but may be provided for employees with a reasonable possibility of being immune, e.g. stating a history of hepatitis but not knowing the type, etc.

D. **Information provided**

Information on the risk of occupational Hepatitis B, as well as other blood borne pathogens, will be provided to all employees at risk.

E. **Declining vaccination**

Should an employee choose to decline the vaccine, a declination from will be completed and the employee will be informed that he/ she may be vaccinated at any time in the future. (See attached Hepatitis consent form.)

F. **Post-vaccination screening**

Post-vaccination screening is not done routinely with the exception of dialysis staff. Should an exposure to blood or other body fluids occur, antibody screening will be obtained and the immunization repeated if needed. Current standards do not provide an interval after which a vaccine booster should be given. Studies of vaccines have shown that the antibody may persist for a number of years after the series has been taken.

G. **Screening of dialysis staff**

Susceptible staff: includes staff who is HBsAg(-) and/or HBsAb(-), should be tested semiannually, or those who are in process of receiving vaccine series. Vaccines: Anti-HBs after completing series (if positive-no further screening unless an exposure occurs). New Hires: HbsAg anti HBs only if vaccinated

H. **Maintenance of records**

Records of vaccination of staff shall be maintained by the personnel department

5.1.3 **Chicken pox vaccination For New Recruitments**

A. As recommended by the infection control committee, the personnel department is requested to incorporate in the personal medical data, the details on whether the incumbent has suffered from Chicken pox previously, which is to be filled by the prospective employee at the time of appointment.
B. Those having no history of chicken pox or vaccination against chicken pox are required to get vaccinated against Varicella before joining the Hospital.

5.1.4 **On contract' staff'**

All contract staff shall be treated as new recruitment.

5.1.5 **Maintenance of records.**

The personnel department shall keep a copy of the vaccination records in the personal files of the staff.

5.1.6 **Screening of stool samples- for carriage of pathogens**

A. All staff to be recruited directly or on contract basis, responsible for handling food handler in the F& B department shall be screened for ova/ cyst and carriage of pathogenic bacteria in their stool sampl
B. Stool sample for 3 consecutive days shall be given for screening for ova/ cysts of parasites and one sample for culture of pathogenic bacteria.
C. In case of positive test results, the tests are to be repeated after the person undergoes appropriate therapy and the stool shall again be submitted for screening.

5.1.7 **Maintenance of Records**

The Personnel department shall keep a copy of all records in the personal files of the staff.

5.2 Employees with infections

5.2.1 **Introduction**

Employees cannot work with acute infections due to the risk of transmission to patients. Early signs of infections (i.e., fever, diarrhea, nausea, productive cough, rhinitis, conjunctivitis, etc.) often mean that large amounts of virus or other pathogens are being shed. A draining wound is a contraindication for caring for patients. When in doubt, speak with your supervisor. Infection control or medical staff is available for consultation when uncertain.

5.2.2 Policy

Employees cannot work with acute infections. Work restrictions shall be enforced in accordance with the table of illness/infections (see attached table 5. A). Employees infected with blood borne pathogens may seek confidential counseling regarding their professional activities and safe practice through the Infection Control, Human resource, Medical Board (MB) or the Director's.

5.3 Table of illnesses/infections and related work restrictions

[Key: EH = Employee Health, N/A = Not Applicable]

Illness/Infection	**Work Restriction**	**Duration**
Acute illness with fever caused by any infection	May not work	Until fever and other symptoms resolve
Conjunctivitis	May not work	Until discharge ceases
Dermatitis of hands/ forearms	May not work (hands-on patient care)	Until cleared by MB
Diarrhea: acute onset with other symptoms a. Patient care personnel b. Food handlers	a. May not work b. May not work	a. Until cleared by MB b. Duration of illness (see nutrition and dietetics policy
Draining wounds: a. Hands, arms, face b. Other areas if covered	a. Remove from patient care or food handling	a. Until cleared by MB

by clothing	b. May work	b. Keep area well covered
Group A Strep Infection	May not work	24 hours after treatment started and with symptom improvement
Hepatitis A	May not work	7 days after onset of jaundice
Hepatitis B: a. Acute b. Chronic active/carrier	 a. MB evaluation. and Counseling b. MB/ HR counseling is available	 a. As per evaluation by MB b. N/A
Hepatitis C: a. Acute b. Chronic active/carrier	 a. MB evaluation. and counseling b. MB counseling is available	 a. as per evaluation by MB b. N/A
Herpes simplex: a. Genital b. Hands (whitlow) c. Facial	 a. Good hand wasing b. No direct patient care (less than1 yr children with exema/burns, immunocompromised patients of any age) c. Mask for direct patient care	 a. N/A b. Until lesions dry and crusted c. While lesions are draining
HIV/AIDS related infections	None unless otherwise noted in this table.	N/A

	Confidential counseling available through Treating physician or Counsellors	
Measles: a. Active b. Post exposure in susceptible host or status unknown (pending titer)	a. May not work b. May not work	a. Until 4 days after rPNH appears and afebrile b. From day 5 through day 21 after exposure regardless of whether Immune Globulin or vaccine given post exposure.
Mumps: a. Active b. Post exposure in susceptible host	a. May not work b. May not work	a. Until 9 days after onset of parotitis b. From day 12 through day 25 after exposure
Tuberculosis (active pulmonary or laryngeal disease)	May not work	Until completion of a minimum of 14 days of 4 drug therapy, with clinical (cough resolved, afebrile) and bacteriologic (3 sputum smears neg for AFB) improvement.

5.4 Management of Health care worker exposure to blood and body substances

5.4.1. Introduction

Guidelines for the prevention of transmission of infection to personnel and patients have been published in the infection control manual, section 2, "Isolation Guidelines." compliance with these guidelines should minimize potential for Health care worker (HCW) exposure to blood and other body substances.

5.4.2. Scope

All the Consultants, Jr. Residents, Staff nurses and other personnel at **INODAY HOSPITAL**, are covered by the "Protocol for Management of Health Care Workers following occupational exposure to blood borne pathogens" and the" post exposure prophylaxis for Health care workers following occupational exposure to human immunodeficiency virus."

5.4.3. First aid treatment

Following an accidental exposure to blood or hazardous body fluids, the HCW should immediately clean/decontaminate the site. Wash wounds and contaminated skin with soap and water; rinse nose, mouth, eyes with copious amounts of saline or tap water. Do not wash skin with bleach. Contact lenses need to be removed immediately and decontaminated prior to replacement. Soft lenses may need special decontamination.

5.4.4 Call the nursing supervisor of the concerned area/infection control nurse/ emergency services

HCWs should report exposures as soon as possible to ensure timely assessment of the exposure and to facilitate source patient testing. HCWs are responsible for initially

contacting the Nursing Incharge/infection control nurse or at Casualty to report any needle sticks, lacerations, splash

es or human bites, which expose them to blood.

The Center for Disease Control and Prevention (CDC) reports that the risk for HIV infection after a percutaneous exposure to HIV-infected blood is approximately 0.3%. The CDC further reports that an increased risk for HIV infection was associated with three factors:

a) The risk increased if the exposure involved a larger quantity of blood, indicated by a device visibly contaminated with the patient's blood, a procedure that involved a needle placed directly in a vein or artery, or a deep injury.
b) The risk increased for exposures to blood from source patients with terminal illness, probably reflecting the higher titer of HIV in blood late in the course of AIDS.
c) The use of Zidovudine (ZVD) post exposure prophylaxis (PEP) may be protective for HCWs. Although failures of ZDV PEP have occurred, ZVD PEP was associated with a decrease of approximately 79% in the risk for HIV seroconversion after percutaneous exposure to HIV-infected blood.

5.4.5. Post exposure prophylaxis (PEP) - HIV

Medical treatment, PEP, involves taking Zidovudine, for 28 days. Although preventing blood exposures is the primary means of preventing occupationally acquired HIV infection, treatment with Zidovudine, an antiviral agent, has been associated with a decrease for HIV seroconversion after percutaneous exposure to HIV-infected blood.

In addition to Zidovudine, Lamivudine will usually be recommended for increased antiviral activity and activity against many Zidovudine resistant strains. The extent to which PEP will be recommended or offered will depend upon how the exposure is defined by the hotline responder and the HCW.

A third drug, a protease inhibitor, may also be offered under certain circumstances. Characteristics of the exposure and/or the source patient will be taken into consideration when recommending PEP.

On exposure to HIV infected blood/body fluids, follow the under mentioned steps:

A. Immediately following an exposure.

a. Needle sticks and cuts should be washed with soap and water
b. Splashes to the nose, mouth or skin should be flushed with water.
c. Eyes should be irrigated with clean water, saline or sterile irrigants.
d. Pricked finger should not be put into mouth reflexly.

B. Reporting of the exposure.

a. Consider it an emergency.
b. Report the exposure to the nurse-in-charge immediately.
c. Record the incident and sequence of events (Ward in charge.)
d. ICC to be informed through the approved incident report as soon as possible.
e. See ER physician immediately.

C. Post exposure prophylaxis.

a. To be decided by the ER physician on the basis of degree of exposure to HIV and the HIV status of the source from whom the exposure / infection has occurred.
b. If required, PEP to be started with in 4 hours and not later than 24 hours of exposure.
c. Drugs will be made available in the ER for ready use and prescribed by the ER physician.

D. Post exposure test.

Upon exposure the HCW will be tested for HIV (informed) on the following intervals: -

a. Base line HIV– at the time of exposure.
b. Repeat HIV – at 6 weeks post exposure.
c. Repeat HIV– at 12 weeks post exposure.

5.4.6 Post exposure prophylaxis (PEP)- HBV (Procedure on exposure to blood / body fluids with Hepatitis B).

A. Vaccinated recipient

1. Contact from sources who are HBsAg +ve.

   Where the post-vaccination anti-HBs level is known to be protective (greater than10 IU/ml), either no action may be taken or a booster dose of vaccine may be given. Where the post-vaccination anti-HBs level is not sufficient or a post-vaccination result is not available, then HBIG should be given followed by a booster. The anti-HBs level is determined afterwards.

2. Contact from sources who are HBsAg –ve.

   No action is necessary. The anti-HBs level in the recipient should be assessed.

3. Contact from an unknown source or blood from the source is unavailable for any reason.

This should be treated as if the source is HBsAg positive. However, discretion should be exercised especially in cases where the donor is from a high-risk group.

B. Unvaccinated recipient

a. Contact from source who are HBsAg +ve

Where the recipient is unvaccinated, HBIG has to be given. An accelerated course of active immunization should begin 2 weeks later.

b. Contact from source who are HBsAg -ve

No HBIG is given but it is recommended that a full course of active immunization against HBV be given.

c. Contact from an unknown source or blood from the source is unavailable for any reason.

This should normally be treated as if the source is HBsAg positive. When the source is in a high-risk group then HBIG should be given.

5.4.7 Follow-up with the employee exposure program:

The infection control nurse will do the follow-up assessment of their Hepatitis B immunity status. HIV and Hepatitis C will also be assessed. HIV testing will only be done with the HCWs expressed written consent.

5.4.8 Written exposure summary statement:

An exposure summary statement will be provided to the HCW after baseline testing is completed on the HCW and source patient.

Section 6: Infection control activities

6.1. Environmental monitoring

Bacteriological monitoring of O.T. / I.C.U.s and other critical areas

a) Method:

i) Settle plate method.

ii) Four culture plates shall be exposed for 30 minutes periodically in each of the following areas, at least once a month.

b) Operation Theatres (O.T.)

c) Intensive Care Units (I.C.Us)

d) Any other area as deemed fit to be put under surveillance, by the infection control committee/infection control team.

e) Other critical areas shall be monitored periodically but at least once in three months:

i) CSSD

ii) Sample Collection Room

iii) Injection and Dressing Room

6.1.2 Air sampling acceptability criteria of environmental study by settle plate method

	O.T.		ICUs
	OT, Ortho and Neuro OT (CFU)	OTHERS	
Satisfactory	Less than 30	Less than50	Less than100
Acceptable Limits	30 - 50	50 -100	100 -200 (
Not Satisfactory	Greater than 50	Greater than 100	Greater than 200

Action required on the results

A. Satisfactory: Continue the practices.

B. Acceptable limits

a) Hand written information should be provided to the OT-in charge on the next day of exposure of culture plate(s).

b) Action required: After receipt of the report, the following is advised to be carried out:

i) Clean, disinfect with 2 % Bacillocid solution and for Bacillocid spray as per manufacturer's direction before and after each operation till results become satisfactory.

C. Not Satisfactory

a) Hand written information shall be provided to OT Incharge on the next day of exposure of culture plate(s). The date and time of information shall be recorded in the lab and by OT Incharge.

b) Action required: After receipt of the report, it is advisable to carry out the following:

i) Clean, disinfect with 2 % Bacillocid solution, bacillocid spray as per manufacturer's direction. Repeat the procedure twice before restarting. Bacillocid shall be replaced by fumigation if longer period of closure of OT is required.

ii) When the results are not satisfactory, monitor patients operated in OT a day earlier and on the day of exposure of the plate.

iii) Check the physical activity and population density (number of persons in the area, total number of persons who have entered the area during exposure of the plates, frequency of the opening and closing of door etc.)

iv) Atmospheric pressure difference between outside and inside

v) Checks if patient(s) in the area was (were) known infected case(s).

vi) Any other cause

6.2. Monitoring of disinfectants

In- use test (Kelsey syke's test)

The "in use" test shall be performed to check the end results of disinfection. Samples shall be taken from disinfectant dilutions in use in the hospitals for any purpose.

Procedure

a) Transfer one ml of the disinfectant fluid into a tube containing 9 ml of the diluent.
b) The diluents used for different groups of disinfectants include nutrient broth for alcohols, aldehydes, hypochlorite's and phenols
c) Withdraw a small aliquot with a 50-drops/ml pipette
d) Place 10 drops separately on the surface of nutrient agar in duplicate
e) Incubate both the plates for 72 hrs – one at room temperature and the other at 37^{O} C
f) Growths from more than 5 of the ten drops in either of the plates indicate a failure of the disinfectant.

6.3. Bacteriological analysis of drinking water

Water from different sources in the distribution system and prior to entry into the distribution system shall be periodically tested bacteriologically. Water shall be collected in appropriate heat-sterilized bottles using standard techniques (Mackie and Mc Cartney: Practical Medical Microbiology, Volume 2, 13tn Ed) as below:

"Aseptically pipette one 50 ml volume and five 10 ml volume of the water into vessels containing corresponding 50 ml and 10 ml volumes of double strength medium" (Mac Conkey Broth with indicator); Such water sample shall be then subjected to multiple tube test methods for Most Probable Number (MPN). Interpretation and determination of

bacteriological standards applied are in keeping with those recommended by WHO (1971) and the European Community (1980) as below:

Grades of the quality of drinking water supplies determined by the results of periodic Escherichia coli and coliform count.

Reportable results from routine samples

Quality of supply	Coliform Count/100 ml	E.coli Count/100 ml	Tolerance
1. Excellent	**0**	**0**	In all samples provided that coliform organisms
2. Satisfactory	**1-3**	**0**	
3. Intermediate	**4-9**	**0**	Do not occur in consecutive samples or in more than 5% of samples.
4. Unsatisfactory	10 coliforms (or) any coliform organisms present in consecutive sample (or) Presence of any coliform organisms in more than 50% of routine samples.	1 or more with E.Coli	

Information is transmitted and appropriate action is taken by Engineering, Maintenance & the concerned department

6.4 Bacteriological analysis of water for Dialysis:

Bacteriology of product water

Sample shall be assayed within 30 minutes of collection, or immediately stored at a temperature between 1 - 5°C and assayed within 24 hours of collection. Total viable counts (standard plate counts) shall be obtained using conventional microbiology assay procedure (pour plate, spread plate, membrane filter techniques including dip test devices, etc.). The calibrated loop technique is not accepted. Culture media shall be Tryptic Soy Agar or equivalent. Colonies shall be counted after 48 hours of incubation at 37 (positive1-2) °C.

Plate count

With a sterile graduated pipette, place 1 ml water in two sterile petri dishes (4 inches in diameter) and add 9 ml. media, melted and cooled to 50°C. Mix thoroughly and allow to solidify.

The media shall be as transparent as possible. Incubate at 37°C for 48 hours and take the readings.

6.5 Antimicrobial susceptibility monitoring

Susceptibility pattern of antimicrobials shall be monitored periodically and for blood stream, respiratory tract, urinary tract, pus and wound isolates.

Analysis shall be carried out at the department of microbiology and shall be presented every three to six months.

Salient features shall be conveyed to the infection control committee at its meeting while presenting results of environmental monitoring and other infection control surveillance activities.

A bulletin may be brought out to disseminate the salient features of recent antimicrobial susceptibility trends along with the isolates, to relevant persons including residents and consultants.

Outbreak Investigation Plan

6.6.1 Definition

The occurrence of two or more similar cases relating to place and time is identified as a cluster or an outbreak and needs investigation to discover the route of transmission of infection and possible sources of infection in order to take measures to prevent further spread.

6.6.2 Epidemiological methods investigation of an outbreak requires

Formulation of a hypothesis regarding source and spread

i) Common source

ii) Person to person spread: microbiological investigations.

6.6.3. Steps to be taken to investigate an outbreak

Step 1

Recognition of an outbreak

i) Increase in the number of cases of a particular infection
ii) Increase in the number of a particular organism
iii) Clustering of cases

Preliminary investigation

i) Case definition
ii) Site identification
iii) Pathogen identification

iv) Patients at risk

Determination of magnitude of problem and immediate control measures if needed

i) Isolation
ii) Cohorting
iii) Barrier nursing

Verification of diagnosis

i) Case review for definition

Step 2

Notification to Infection Control Coordinator

Step 3

Case analysis

i) Demographics
ii) Clinical signs and symptoms
iii) Risk factors
iv) Predisposing factors
v) Microbiological investigations
   a. Cultures from body sites depending upon the epidemiology of infection
   b. Cultures from other patients
   c. Environmental cultures
vi) Arrival at some conclusion and control measures

Step 4

Immediate control measures: initiated as soon as possible of the suspected outbreak

i) Strict hand washing

ii) Intensification of environmental cleaning and hygiene

iii) Adherence to aseptic protocols

iv) Strengthening of disinfection and sterilization.

Specific control measures

i) Identification and elimination of the contaminated product

ii) Modification of nursing procedures

iii) Identification of treatment of carriers

iv) Rectification of lapse in technique or procedure

Step 5

Monitoring for the effectiveness of control measures

a. Continued follow up of cases after the outbreak, clinically and microbiologically
b. Documentation of outbreak

Step 6

Report preparation with sequence of events.

6.6.4 Responsibility

1. Infection control nurse: For collection of relevant data
2. Microbiology section: For investigation of the outbreak
3. ICC: For formulating the policies to prevent its recurrence

6.7 Antimicrobial policy guidelines

6.7.1 Definitions:

Antimicrobial agent/ Antibiotic: Any agent, which has a potential for or is used with an intention of affecting microbial growth inside or on the human body. This includes antibacterial, antifungal, antiviral and antiparasitic agents.

Prophylaxis/ Prophylactic antimicrobial agents/Antibiotic prophylaxis: Administration of an antibiotic or antimicrobial agent prior to the onset of symptoms in order to prevent clinical infection.

Empirical Antibiotic/Antimicrobial therapy: This is an early institution of antimicrobial therapy pending the results of culture and / or other relevant investigation and clinical response, in patients who have an illness and in whom there is an expectation of an infectious cause, the treatment being directed against the most likely microbial agent(s) in that particular episode.

Organism directed Antimicrobial therapy: Usage of antimicrobial agent against infection by specific microorganisms

6.7.2General features

a. Prophylactic therapy shall not exceed 24 hours duration after starting the 1st dose. Empiric therapy shall not continue beyond 72 hours or so till the report of culture and sensitivity is available. A review shall be done and if necessary antimicrobials are represcribed.
b. Fever, redness and swelling do not mean infection. Inflammation is not synonymous with infection.
c. Antimicrobial agents circulate in blood stream and in the micro vascular compartment. Third space infections are best drained.
d. Body immunity shall take care of a large number of non-virulent organisms.
e. Barring a few situations, antibiotic/antimicrobial therapy shall be started after appropriate samples for cultures have been taken without detrimental effect on the patients.

f. Local wound infections generally need no antimicrobial agents.

Note: Abscess or pus collection needs adequate drainage; antimicrobial agents are often less effective.

6.7.3Criteria for antimicrobial usage

A Therapeutic usage:

a) Antimicrobials are used for infections by specific microorganisms. As far as possible, a broad spectrum antimicrobial acting against such specific infective agent shall be used.
b) Diagnosis of infection is based on clinical and / or laboratory evidence.

B. Prophylactic usage:

a) Primary prophylaxis in contact cases of tuberculosis, diphtheria and meningococcal diseases.
b) Secondary prophylaxis in case of rheumatic fever.
c) Post exposure prophylaxis in case of exposure to HIV/ HBV/ HCV infected blood or body fluids as defined under the 'policy for needle stick injury' or accidental inoculation and percutaneous mucus membrane exposure to blood and body fluid substances.
d) Prophylaxis in the immunosuppressed and immunocompromised
e) Surgical prophylaxis
f) Post spleenectomy patients

C. Indications for clinical use of antimicrobial combinations

Antimicrobial combinations are acceptable in the following situations:

A. Prevention of emergence of resistant organisms

B. Polymicrobial infection

If the polymicrobial-infecting flora has either an Enterococcus or MRSA, or if the organisms are not covered adequately by a broad spectrum Cephalosporin (3rd or 4th generation) or a Carbapenem.

C. Empirical therapy

In neutropenic patients or in patients in whom the nature of infection is unclear only till the time culture and sensitivity reports are not available.

Two agents are generally sufficient such as Ticarcillin-Clavulanate / Piperacillin-Tazobactam plus Gentamicin / Tobramycin. Once the culture reports are available, a switch over to single antimicrobial shall be done as soon as possible.

If there is a case of persistent fever with neutropenia after 5 days of Empirical Antimicrobial therapy, it is advisable to add Amphotericin B, while waiting to prove fungal infections.

A combination of Amphotericin B and Fluocytosine is useful in treating cases

D. Synergism in infection of immunosuppressed or immunocompromised patients:

Even in cases of susceptible organism, two drugs shall have to be combined in cases of abnormal host defense systems. Generally for gram-negative bacilli, a combination of Cephalosporin or Ticarcillin, or Piperacillin with an aminoglycoside is advocated.

Caution: A combination of Betalactam - Betalactam antibiotic e.g. Ceftazidime + Ceftriaxone or Cefuroxime or Amoxyclav shall be antagonistic in nature.

Their combination shall be avoided except in situation such as infections with Burkholderia cepacia and Stenotrophomonas maltophilia where Ceftazidime can be

combined with Piperacillin plus Tazobactam or Piperacillin or Ticarcillin plus Clavulanate.

E. Synergism

This is used in cases of moderately resistant organisms showing such a resistant pattern for all or most of the drugs, which can be safely given in such a patient. Two drugs to which the organism shows moderate resistance or to which the MIC values are high (not in the sensitive zone) can be combined to have such an effect. Synergistic combinations have to be used in cases of Bacterial Endocarditis especially with respect to Enterococcus spp. This shall require Penicillin and Streptomycin / Kanamycin / Amikacin / Gentamicin combination.

Many serious infections with Pseudomonas aeruginosa shall respond to a combination therapy with Carbenicillin, Ticarcillin, Mezlocillin, Azlocillin or Piperacillin with Gentamicin /Tobramycin /Amikacin or Ciprofloxacin.

Cotrimoxazole as a fixed combination therapy can be used in selective situations or it can be combined with three or four other agents in case of infections with organisms like Burkholderia cepacia and Stenotrophomonas maltophilia where IV Cotrimoxazole can be combined with Ceftazidime /Meropenem and **Piperacillin plus** Tazobactam or Ticarcillin-Clavulanate plus Tobramycin/Amikacin.

F. Bacterial Meningitis

All cases of bacterial meningitis may be put on empirical therapy with a combination of Ceftriaxone plus Vancomycin / Teicoplanin (community acquired)

A Carbapenem like Meropenem may replace Ceftriaxone in case a hospital-associated infection is suspected.

All such therapy should be reviewed and changed to narrow spectrum as soon as possible.

6.8 Monitoring of patients for hospital acquired infection

6.8.1 Patients admitted shall be monitored for development of hospital-associated infections.

6.8.2 All patients who are admitted in ICUs and other critical care areas shall be put under surveillance initially. This shall be extended slowly to cover all patients admitted in areas of hospital utilized as patient care area. Follow up in the OPD shall be addressed later on.

6.8.3 Infection control nurse shall carry out the surveillance activity. She shall be assisted in this activity by any one designed by infection control team/committee/management as deemed fit.

6.8.4 The activity shall include monitoring for:

a. Post operative wound infections or Surgical Site Infections (SSI).
b. Urinary Tract Infections (UTI)
c. Ventilator Associated Pneumonia (VAP)
d. Catheter Related Blood Stream Infections (CRBSI)

6.8.5 A proforma shall be filled up as approved by infection control team and all follow up for that particular patient shall be done on this proforma.

6.8.6 Infection control officer shall review such proforma each day.

6.8.7 Infection control team in conjunction with the area concerned and the consultant(s) shall undertake necessary action for infection control purposes on the basis of monitoring exercises as and when required

6.8.8 Results of monitoring shall be tabled before the infection control committee in its subsequent meeting and shall be submitted to the management.

Acknowledgement

Recommendation of CDC and the healthcare Infection Control Practices Advisory Committee (HICPAC) as available for their website (www.cdc.gov) have been referred for the preparation of this manual

Section 7

Annexure 1

Standard Precautions (including universal work precautions) and safe practices

1) WPNH hands after patient contact and after removing gloves.
2) WPNH hands immediately, if contaminated with body fluids.
3) Wear gloves when contamination of hands with body substances is anticipated
4) Protective eyewear and masks should be worn when splashing with body substance is anticipated
5) All health care workers should take precautions to prevent injuries during procedures and when cleaning as well as during disposal of needles and other sharp instruments.
6) Needle should not be recapped
7) Needles should not be purposely bent or broken by hand
8) Needle should not be removed nor manipulated by hand
9) After use disposable syringes and needles, scalpel blades and other sharp items should be placed in a puncture resistant container.
10) Health care workers who have exudative lesions or dermatitis should refrain from direct patient care and from handling equipment
11) All needle stick injuries should be reported to designated supervisors/ medical officers.
12) Handle and dispose of sharps safely.

13) Clean and disinfect blood / body substances spills with appropriate agents (10% hypochlorite)
14) Adhere to disinfection and sterilization standards
15) Regard all waste soiled with blood/body substance as contaminated and dispose of according to relevant standards
16) Vaccinate all clinical and laboratory workers against Hepatitis B
17) Other measures: double gloving, changing surgical techniques to avoid exposure prone" procedures, use of needle-less systems and other safe devices.

Annexure 2

Safety in the laboratory

1. Eating, drinking, smoking and applying cosmetics are prohibited in the laboratory.
2. Mouth pipetting is prohibited.
3. Staff must behave in a safe and responsible manner at all times.
4. Appropriate protective clothing must be worn at all times when in the laboratory and whenever possible, gloves should be worn.
5. The laboratory must be kept clean and tidy and should only contain items necessary for the work to be carried out.
6. All work surfaces must be appropriately decontaminated at the end of each working day and after any spillages.
7. All staff must wash their hands when leaving the laboratory.
8. Care must be taken to avoid the formation of aerosols or the splashing of materials.
9. All contaminated, wasted or reusable materials must be appropriately decontaminated before disposal or reuse.
10. Access to the laboratory is restricted to authorize personnel only.

11. All incidents/ accidents must be reported immediately, and appropriate action should be taken to prevent further occurrences.
12. In case of accidents with splashes, use water eye splashes and showers (fitted in each laboratory) immediately.

All staff working in laboratories must be adequately trained, both in the duties that they perform as well as in all safety aspects of laboratory work.

Annexure 3

Name of staff:_____ Emp. ID: _____

Unit: _____ Date of NSI _____ Time _____

Source patient if known , UHID: _____

Serostatus of Injured Staff (√ as app.)					Serostatus of source patient (√ as app.)				
HIV	-ve	☐	+ve	☐	HIV	-ve	☐	+ve	☐
HBV	-ve	☐	+ve	☐	HBV	-ve	☐	+ve	☐
HCV	-ve	☐	+ve	☐	HCV	-ve	☐	+ve	☐

I PEP For HIV (V as app.)

Exposure of Blood /BF to intact skin does not require any PEP.

Determine exposure code and V as app.

☐ EC - 1 = Small volume (e.g. few drops / contact for short duration)

☐ EC - 2 = Large volume (e.g. large volume / major splash / contact for long duration / several minute or more.

☐ EC - 3 = Deep puncture / Large volume / Visible blood on device.

Determine source code and tick (✓) as applicable.

☐ Source sero -ve = SC1

☐ Source sero +ve = SC2

☐ Source unknown = SC2

Use following Treatment Regimen as per EC and SC

	EC	SC	PEP Regimen
☐	1	1	PEP Not Required
☐	1	2	Basic Regimen
☐	2	2	Expanded Regimen

☐	3	2	Expanded Regimen
☐	2/3	Unknown	Basic Regimen
☐	2/3	1	Evaluate Risk Factor of Source*

*Source has high risk behaviour ☐ Yes ☐ No

If No, no treatment required. If Yes, follow Basic Regimen

Basic Regimen - Tab Duovir (Lamivudine 150 mg positive Zidovudine 300 mg) 1 tab. twice a day for 28-days.

Expanded Regimen - Basic positive Indinavir 800 mg thrice a day for 28-days.

High Risk Behavior: Check with the high-risk assessment form of the source patient

(Treatment to be initiated within 04-hours and not later than 48-hours)

II PEP for Hepatitis-B Virus

Immunization status of staff (√ as app.)

Non-immunized	☐ Yes	☐ No
Immunization schedule completed (3 doses)	☐ Yes	☐ No
Partially immunized (one or two doses or inappropriately spaced)	☐ Yes	☐ No
Antibody titres known (greater than 10 IU)	☐ Yes	N☐

PEP Determination for HBV

Immunization of staff	Source status	Treatment
☐ Fully immunized	Source HbsAg-ve	No HBIg, No Vaccine
☐ Partially immunized	Source HbsAg-ve	Follow vaccine as per Vaccination schedule.
☐ Not immunized	Source HbsAg-ve	Start vaccination
☐ Fully immunized	Source HbsAg +ve	No further action if antibody titres are adequate (greater than10 IU/ml)*
☐ Partially immunized	Source HbsAg positive	StartHBIg and follow vaccine as per schedule
☐ Not immunized	Source HbsAg positive	Start HBIg and Start Vaccination HBIg Dose: 0.07ml/kg I/M stat

- If antibody titers are unknown: Advice for a titer check within 24-hours and initiate Ig as per indication
- Check the antibody titres if only two doses of vaccine have been given before giving HBIG

- If the source status is unknown, consider it as a positive case & manage as per the algorithm

Follow the below mentioned schedule for vaccination if staff not immunized

0 dose (1ml)	-	At the time of injury
1st dose (1ml)	-	After 1-month
2nd dose (1ml)	-	After 6-months

Form filled by:

Name of Doctor: _____ Signature: _____

Time: _____ Date: _____

Nursing Supervisor on Duty:

Name: _____ Emp. ID.: _____ Shift: _____

Note: Information on NSI Mail ID. Initiation of treatment with in 04-hours.

Annexure 4

I. CATERGORIES OF DISINFECTANTS

1. Environmental disinfectants

Phenolics	Trade Name
Clear soluble phenolics	Hycolin, Stericol, Clearsol
Black/White Fluids	Lysol, Phenol, Carbolic acid
Chloroxylenol	Dettol
Chlorine based	
Hypochlorites	Sodium Hypochlorite 10 %
Sodium Dichloroisocyanurates	Clean and Sept
Hydrogen per oxide based	
	Presept, H_2O_2 30 %
Aldehyde based combination	
	Bacillocid

2 Instrument Disinfectants

Aldehyde	
2 % Gluteraldehyde	Cidex, Glutithyde
0.55 % Pthalaldehyde	Cidex OPA

3 Skin Disinfectants

Chlorhexidine 4 %	Hibiscrub, Hitane, Chlorhexidine, **Microsheild**
Alcohols based	Ethanol, isopropanol, Sterillium, Stellisept
Iodine and Iodophore based	Povidone Iodine 10 %, Surgical scrub- Povidone Iodine 7.5 %,Tincture of iodine, Microshield PVPS (10%)
Quaternary ammonium compounds	Cetavolon

II. DECONTAMINATION & DISINFECTION

Table1. Decontamination of Equipment and Environment

Equipment/Site	**Routine/Preferred Method**	**Acceptable /Alternative/ Additional recommendation**
Airways and End tracheal tubes	Single use Heat (Autoclave, ETO, Low temp steam)	1) Chemical disinfection (Chlorine based/ Glutaraldehyde)
Baths	Non infected patients Wipe with detergent solution and rinse: chemical cleaning may be used for stain and scum removal	Infected patients and patients with open wounds Chlorine compound with detergent.
Bed frames	Non infected patients WPNH with detergent and dry	After infected patient Chlorine compound/ Phenol / Bacillocid

Bed pans	WPNHer-disinfector	Patients with enteric infections : Heat disinfection after emptying and wPNHing. Or chemical disinfection with Chlorine compounds/ Bacillocid
Bowls (surgical)	Autoclave	
Bowls (washing)	WPNH and dry, Store inverted	For infected patients use Individual bowls and disinfect on discharge 1) Heat disinfection 2) Chlorine/ Phenol/ Bacillocid
Crockery and Cutlery	1) Dishwasher with rinse temp above 80 degree C and air dry 2) Hand wash by approved method	For patients with enteric infections or open tuberculosis, if possible, heat disinfect; if not use single use.
Drains	Clean regularly	Chemical disinfections is not advised
Endoscopes	See Table	
Floors (Dry cleaning)	1) Vacuum clean 2) Dust attracting dry mop	No brooms in patient areas
Floors (wet cleaning)	WPNH with detergent solution; routine disinfection not required	Known contaminated area: Chlorine / Phenol/ Bacillocid
Furniture and Fittings and Locker tops	Damp dust with detergent solution	Known contaminated and special areas (ICU): Damp dust with chlorine/ Phenol/ Bacillocid
Instruments	Heat (autoclave/ ETO)	

Mattresses and Pillows	Water impermeable cover: wash with detergent solution and dry	Contaminated: Disinfect with Chlorine/ Phenol/ Bacillocid
Mops (dry, dust attracting)	Do not use for more than 2 days without washing and drying	
Mops (wet) House keeping	Washing machine/ dry daily Manual: rinse after each use, wring and store dry. Heat disinfect periodically	If chemical disinfection required after usage on infected areas: rinse in water, soak in Chlorine (1000 ppm av Cl for 30 min) rinse and store dry
Nail Brush (Surgeon's hands)	Use only if essential	Sterile nail brush should be used
Razors (safety and open)	Disposable / autoclaved	Alcohol immersion for 10 min
Rooms (terminal cleaning/ disinfection)	Non infected patients WPNH surfaces in detergent solution	Infected patients Wash surfaces in 500 ppm available Chlorine,/ Phenol/ Bacillocid. Fogging / Fumigation not recommended
Shaving brushes	Do not use for clinical shaving	Autoclave. Use brushless cream or shaving foam
Sputum container	Disposable (Single use only)	Autoclave
Thermometers (Oral)	Individual thermometers: wipe with alcohol and store dry	Terminal disinfections Disinfect with Alcohol for 10 min, wipe and store dry.
Thermometers	Clean with Alcohol and disinfect with Alcohol for 10 minutes, Wipe	

(Rectal)	and store dry	
Thermometers (Electronic)	Single patient use Immerse probe in Alcohol for 10 minutes, dry	Do not use without sleeve for oral or rectal temperature for pt. With an infectious disease.
Toilet seats	Wash with detergent and dry	After use by infected patients or if grossly contaminated, Disinfect with Chlorine / Phenol/ Bacillocid, Rinse and dry.
Tonometer prisms	Wash, disinfect with 500 ppm av Chlorine for 10 min then rinse	
Tooth mugs	Single patient use (Disposables)	Heat disinfection if not disposable
Trolley tops (Dressing)	Clean with detergent and dry at beginning of dressing round and at the end of it also	If contaminated: Clean first, then use Chlorine. Bacillocid and dry. Alcohol can also be used After cleaning it first.
Tubing (Anaesthetic or ventilation)	Heat disinfection/ETO 1) Washer disinfector 2) Low temperature steam	For patients with tuberculosis 1) Use singleo use tubing OR 2) Heat (washer disinfector/ Low temp steam)
Urinals	Use washer with heat disinfection cycle OR Use single use with shredder	Use Chlorine/ Phenol/ Bacillocid.
Ventilator External circuit	As per guidelines Washing machine at temp of 80	

and Humidifiers Humidifier should be cleaned, dried and refilled with sterile water every 28-72 hrs Nebulizer	degree C for 1 min Low temp steam at 73 degree C Heat disinfection: Washing machine at temp of 80 degree C for 1 min OR Low temp steam at 73 degree C	Rinsed in alcohol after cleaning
Ventilator Internal circuit	As per guidelines Autoclave	 ETO
WPNH basin	Clean with detergent. Use cream cleaner for stains, scums etc. Disinfection not normally required	Contaminated Use Chlorine detergent solution or non-abrasive chlorine powder.

Table 2. Chemical Disinfection of Medical Equipment

Method and Equipment	Immersion time	Level of decontamination
2 % Alkaline Gluteraldehyde		
Gastroscopes	20-30 min	Disinfection
Bronchoscope Mtb (positive)/ Suspected	20 - 30 min 90 – 120 min	Disinfection Disinfection

Cystoscpoes	20 min	Disinfection
Arthroscopes, Laparoscopes	10 min 20 min 120 - 180 min	Disinfection Disinfection Sterilisation
Other instruments	10 min 20 min 180 min	Disinfection Disinfection Sterilisation
70 % Ethanol		
Gasrtroscope	5-10 min	Disinfection
Other Instruments	5 –10 min	Disinfection
Endoscopes, Broncoscopes and other instruments	5 –7 minutes	Disinfection

Table 3.Uses of Disinfectants and Strengths of Solution

A Hypochlorite Chlorine compound : 10 % Solution

USE	**Dilution of stock solution**	**Available Chlorine (%)**	**Available Chlorine (ppm)**
Commercial preparation	Undiluted (available)	10	100,000

Blood spills	1 in 10	1.0	10,000
Laboratory discard	1 in 40	0.25	2500
Environmental Disinfect	1 in 100	0.1	1000
Disinfection of clean instruments	1 in 200	0.05	500
Catering/ Crockery (if required), Surfaces and equipment	1 in 800	0.0125	125

B. Disinfectant Tablets

(Sodium Dichloroisocyanurate: Chlorine based)

Use	**Dilution of tablets**	**Available Cholrine (ppm)**	**Available Cholrine (ppm)**	**Special Instructions**
Blood spills	4 tablets in 110 ml of water	1.0	10,000	Done for 20 minutes
				Exposed

Laboratory discard	1 tablet in 110 ml of water	0.25	2500	till 20 .minutes
Infected Linen	1 tablet in 2 Lt of water	0.0125	125 - 140	Immerse for 1 hour prior to washing
Soiled Linen	1 tablet in 2 Lt of water	0.0125	125 - 140	Immerse for 1 hour prior to washing
Catering/ Crockery (if required), Surfaces and equipment/ rubber and plastic tubing	1 tablet in 2 Lt of water	0.0125	125 - 140	Immerse for one hour
Work surfaces, cupboards, Floors	1 tablet in 2 Lt of water	0.0125	125 - 140	
Dishcloths, Mops	1tablet in 4.6 Lt of water	0.0062	60	Soak to bleach, clean and

				decolorize

C. Phenols

	Products	Clean Condition	Dirty condition
Phenol		1.0 %	2.0%

D.Bacillocid Special

(Dihydroxy Diohexane, Gluteraldehyde, Benzalkonium Chloride, Alkyl Urea derivative)

Contact period: 10 – 20 minutes

USE	**Dilution of stock solution**	**(%) of Solution**	**Precautions**
Environmental disinfection of critical areas ; OT, ICU, Infected areas	200 ml of Bacillocid Special to 10 LT of water	2 %	Avoid contact with concentrated solutions.

(Walls, Trolleys, OT Tables)			Do not mix with other cleansing agent
Surfaces and equipment Electric equipment	50 ml of Bacillocid Special to 10 LT of water Bacillocid 25	0.5 %	

Table 4. Disinfection of skin

Agent	Action	Products	Purpose
Soap	Removes organic matter, transient micro-organisms, with little effect on resident microbial population	Liquid soap, Soap cake	Hand washing
Microbicidal agents: Iodine and Chlorhexidine based	Remove transient and resident flora, Prevent growth of resident flora	Chlorhexidene , Iodine	
	a)	10 % Povidone Iodine,	Skin disinfection of Patient in OT

		Microshield PVPS	
	b)	7.5 % Povidone Iodine	Surgical scrub
	c)	4 % Povidone Iodine	Dressings, skin disinfection
	d)	4 % Chlorheidine	Skin preparation Skin disinfection, Surgical scrub Presurgical shower (if indicated)

Annexure 5

Laundry and Linen Management

INTRODUCTION

Soiled linen can be a source of large amount of microbial contamination which may cause infections in hospital patients and personnel, although the risk of infection appears to be low. In addition, improperly processed linen can cause chemical reactions or dermatitis in those who come in contact with them. A hospital's linen service should process soiled linen so that the risk of disease to patients who may be unusually susceptible or to employees who may handle linen is avoided. Adequate procedures for collecting, transporting, processing and storing linen should therefore be established.

RECOMMENDATIONS

For routine handling of soiled linen

Soiled linen should be handled as little as possible and with a minimum amount of agitation to prevent gross microbial contamination of the air and of persons handling the linen.

All soiled linen should be bagged or put into special carts at the location where used; it should not be sorted or pre-rinsed in patient care areas. Linen that is saturated with blood or body fluids should be deposited and transported in the cloth bags provided for that purpose.

Soiled linen should be removed from patient-care areas daily and may need to be removed more frequently, depending on the amount of soiled linen that is generated.

Handling of Linen of patients with infectious diseases

Linen from patients with infectious diseases from all wards is sorted out in the wards and decontaminated before being brought to laundry. All linen from the isolation ward will be so treated.

Transportation of Linen

All clean linen should be stored and transported in carts used exclusively for this purpose.

The clean linen section should be cleaned every day; Cupboards and walls damp dusted and the floor mopped.

Separating clean linen from dirty in the Laundry

Soiled and contaminated supplies are separated from those that are clean and sterile by room (hospital) design or by the management of work flow in accordance with written policies and procedures.

In the laundry, dirty linen moves through the laundry process from the dirtiest to the cleanest areas. All areas should be cleaned on a regular schedule; e.g., some areas that are quickly soiled may require daily or more frequent cleaning while others may need cleaning every week. The soiled linen wPNHing area is wPNHed daily with plain water and then with 7% Lysol.

Protecting personnel who sort laundry

In the laundry, hand wPNHing facilities and protective garb (e.g., gowns, gloves and goggles and masks) is available to personnel who sort laundry. In the wards sorting of laundry should be done only in the sluice rooms and not at the bedside.

Heavily Solid Items

Floor mops, are laundered separately from linen.

Sterile Linen

Only linen used in procedures requiring sterile technique should be sterilized. This process is done in the CSSD.

Linen which need special handling before dispatch to laundry.

1.	Soiled linens	-	Soaked in soap and water or 2% Lysol for 24 hours in sinks in the sluice room the ward.
2.	HIV and HBs AG	-	Soaked in 2% Sodium Hypochlorite
3.	Linen soiled with Cholera and other Diarrhea fluids	-	Soaked in 5% formalin
4.	Gas gangrene anthrax	-	Bagged and autoclaved before dispatch to Laundry.

All wet linen is considered contaminated and is bagged in bags in the ward area and such linen should be handled using universal precautions.

Supply & Storage of Clean Linen

Clean linen is delivered to the user in such a way as to minimize microbial contamination from surface contact or airborne deposition.

It is desirable to protect linen in individual patient care areas. But once clean linen is distributed for individual patient use, protection or covering is not required. There is no need to provide further protection. There needs to be a functional separation of clean and soiled linen during storage and transport.

Annexure 6

Kitchen Sanitation and food handling

POLICY:

The Dietary department ensures that food prepared and served to patients are received, stored assembled and served in a manner that avoids contamination.

Production kitchen

All food is prepared and served into containers/trays in the main kitchen and then sent to the wards.

Food Temperatures

- Cold food items are maintained in refrigeration at a temperature of 39 – 43 degree F or below. The temperatures are checked daily and a log is maintained of the temperature.

  Vegetables and fruits - 0 – 4 degree C

  Dry stores - Room temperature

- Food prepared to be served cold is cooled from their preparation temperature to 4 degrees C or below. The cooling period shall not exceed 4 hours.
- Hot foods are held at an internal temperature of 63 degrees C or above.

- Both hot and cold food items will be transported in such a manner that appropriate temperatures will be maintained during the transportation of the food.

In-patient Food

- Patient foods are assembled in the kitchen, supervised by professional and trained personnel. They are taken to distribution points floor kitchens) and served by dietary personnel.
- In the Isolation ward dietary workers are taught to observe universal precautions to protect themselves from blood and body fluid contact.

Dietary personnel:

Supervision of Health

Within a short time after employment, all personnel of the dietary department shall receive a physical examination. This is conducted on a routine basis once a year.

Supervisors shall maintain a daily awareness of the health of individuals in specific areas. They shall pay particular attention to signs and symptoms of communicable diseases that can be transmitted by foods. If an employee has boil, infected wound, gastrointestinal illness, he / she is relieved of his / her food handling duties and sent for evaluation.

Dietary personnel shall also be taught to protect food consumers from the body substances of dietary personnel.

Hand wPNHing

Personnel wPNH their hands and exposed portions of their arms with soap and water before starting work. Hand wPNHing includes special attention to the fingernails and areas between the fingers.

Hand wPNHing should be mandatorily repeated after

- using the toilet
- smoking
- eating or drinking
- arranging or combing the hair
- touching the face, nose and eyes
- contact with unclean equipment and work surfaces
- handling raw food

Personnel Habits

- Keep their clothing free from obvious dirt and food spills.
- use hair nets (hair restraints) while on duty
- Use utensils to handle food whenever possible.
- do not consume food or drinks in the food, preparation or serving areas
- do not use tobacco products in any form while engaged in the preparation or serving
- Food handlers will have regular checks once a year for staph, salmonella and cholera.

Departmental inspections

These are carried out in case any problem arises, by the HICC & on a regular basis by dietary staff themselves.

Disposal of waste from the dietary department

Food return to the kitchen is discarded. These and other dietary wastes are kept in covered bins outside the dietary department which are removed once a day by the garbage truck. The waste is then discarded.

Contact with other disciplines

When a food borne illness is suspected, the HICC is notified, specimens may be obtained by the Pathology department from the symptomatic individuals and from suspected food. The

HICC will be responsible for obtaining significant histories and conducting the investigation of a suspected food borne illness.

Equipment, Housekeeping & clearing

Procedures for cleaning and care of equipments. For cleaning food contact surfaces, vim, multi-clean, liquid soap, and isopropyl-alcohol shall be used.

Annexure 7

House Keeping Services

A. 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. Detergent and copious amounts of water should be used during one cleaning. Eco shield may be used to mop the floor for the remaining times.
- The walls are to be washed with a brush, using detergent and water once a week
- High dusting is to be done with a wet mop
- Fans and lights are cleaned with soap and water once a month.
- All work surfaces are to be disinfected by wiping with Eco shield 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 a month or whenever soiled. These curtains are to be sent for regular laundering. In certain areas, e.g. Transplant units and ICUs, more frequent changes are required.

- Patient's cot is to be cleaned every week with detergent and water. 1% 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 week.
- The floor of bathrooms is to be cleaned with a broom and detergent once a day and then disinfected.
- Toilets are cleaned with a brush using a detergent twice a day (in the morning and evening). Disinfection and stain removal solution may be used.
- WPNH basins are to be cleaned every morning
- Regular AC maintenance is required. The AC section should draw up a protocol for this.

a. Patient linen

- 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.
- Dry dirty line is to be sent to the laundry for regular wash.
- Line soiled with blood or body fluids, and all linen used by patients diagnosed to have HIV, HBV, HCV and MRSA, is to be decontaminated by autoclaving before being sent to the laundry.

b. Miscellaneous items

Kidney basins, basins, bed pans, urinals, etc to be cleaned with detergent and water and disinfected with 7% Lysol.

B. House Keeping In Operation Theatre

- Theatre complex should be absolutely clean at all items. Dust should not accumulate at any region in the theatre.

- Soap solution is recommended for cleaning floors and other surfaces. Operating rooms are cleaned daily and the entire theatre complex is cleaned thoroughly once a week.
- Before the start of the 1st case
- Wipe all equipment, furniture, room lights, suction points, OT table, surgical light reflectors, other light fittings, slabs etc with soap solution. This should be completed at least one hour before the start of surgery.

a. 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.

b. Instruments

Used instruments are cleaned immediately by the scrub nurse and the attender. Reusable sharps are decontaminated in Lysol / hypochlorite and then washed in the room adjacent to the respective OR by scrubbing with a brush, liquid soap and vim. They are then sent for sterilization in the CSSD. After septic cases the instruments are sent in the instruments tray for autoclaving. Once disinfected, they are taken back to the same instrument cleaning area for a manual wPNH described earlier. They are then packed and re-autoclaved before use.

c. Environment

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

d. 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 receptables, equipment, furniture with ecoshield.
- WPNH floor and wet mop with liquid soap and then remove water and wet mop with Bacilliforms solution.
- Clean the storage shelves scrub & clean sluice room.

e. Weekly cleaning procedure

- Remove all portable equipment.
- 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 with detergent.
- Scrub floor using detergent and water or Bacilliform.
- Stainless steel surfaces – clean with detergent, rinse & clean with warm water.
- Replace portable equipment: Clean wheel castors by rolling across toweling saturated with detergent.
- WPNH (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)
- After washing floors, allow disinfectant solution to remain on the floor for 5 minutes to ensure destruction of bacteria (Bacilloflor)

f. 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.

Annexure 8

Mortuary Practices

A. Guidelines:

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, HEV and the
- Human immunodeficiency virus (HIV)
- Tuberculosis
- Gastrointestinal organisms
- Group A streptococcal infection
- Possibly meningitis and septicemia

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

B. Immunizations recommended:

- Hepatitis B

- Tetanus

Annexure 9

Engineering Control

POLICY:

The preventive maintenance of all equipment will ensure efficiency of all staff and reduce chances of contamination of air and water. The proper care and maintenance of the entire physical structure will also reduce accumulation of dust and spores in the environment. Thus the engineering dept and its personnel are important links in the chain of activities towards hospital infection control.

All personnel should apply universal precautions when in contact with patients or blood and body fluids.

General

- Engineering personnel shall report to the ward sister prior to commencing work in a patient's room or area, and follow her directions with regard to dressing, scrubbing etc. Engineering personnel shall check out with the ward sister upon completion of work.
- Engineering employees shall maintain a neat, clean appearance at all times. Personnel hygiene such as washing after using toilet facilities etc will be observed. All engineering personnel must be aware of universal precautions.
- Prior to entering areas requiring sterile attire such as the OR, engineering employees shall wear the prescribed clothing. Engineering personnel shall check in and out with the permission of the supervisor.
- Hand washing should be followed before and after leaving the patient care area.

Plumbing job guidelines

- Hospital water supply systems shall not be connected with any other piping system or fixtures that could allow contamination without the use of adequate air gaps or approved back flow preventers or vacuum breakers.
- When using implements to unstop faulty drains, wear rubber gloves.

- When rubbing out main sewer lines, or when exposed to gross contaminated wastes, wear rubber boots and rubber gloves.
- After exposure to sewer lines or gross contaminated waste, clean exposed areas of body with soap and water. Change uniform if necessary. Do not return to patient care areas before cleaning up.

Physical barriers between repair area and patient care facility.

- When any construction or repair work is carried out in patient care areas the supervisors must inform the Medical Superintendent / RMO, who will inform the heads of the concerned departments so that patient may be shifted if required.
- When work is carried out in areas where immune compromised patients or that requires a sterile atmosphere, adequate physical barriers must be present to prevent the spread of fungus and other such microbes, through dust and debris generated.
- All areas that require a sterile atmosphere must be fumigated before use following construction work.

Ventilation Systems.

- Regular cleaning of all window AC filters must be carried out in a systematic manner throughout the hospital.
- AC filters should be placed in formalin solution for at least an hour at each cleaning.
- In areas such as the microbiology labs where handling of infected material is carried more frequent checks and cleaning of AC filters is required.
- In situations where HEPA filters are used regularly checks must be carried out as the environmental dust load is very heavy in these areas and the filters get clogged quickly.
- When microbial load increase as evidenced by results from the environmental surveillance, the filters must definitely be checked.
- In areas where central air-conditioning is used the moisture of the air and the ventilator air changes must be carefully monitored. All ducts must be washed thoroughly at regular intervals and fumigated.