



SARADA KRISHNA HOMOEOPATHIC  
MEDICAL COLLEGE HOSPITAL,  
KULASEKHARAM.

DOCUMENT NAME: INFECTION PREVENTION AND  
CONTROL MANUAL

**INFECTION PREVENTION AND CONTROL MANUAL**

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### CONTROL OF THE MANUAL

- The holder of the copy of this manual is responsible for maintaining it in good and safe condition and in a readily identifiable and retrievable.
- The holder of the copy of this Manual shall maintain it in current status by inserting latest amendments as and when the amended versions are received.
- Manager Quality is responsible for issuing the amended copies to the copyholders, the copyholder should acknowledge the same and he /she should return the obsolete copies to the Manager Quality.
- The amendment sheet, to be updated (as and when amendments received) and referred for details of amendments issued.
- The manual is reviewed once a year and is updated as relevant to the hospital policies and procedures. Review and amendment can happen also as corrective actions to the non-conformities raised during the self-assessment or assessment audits by NABH.

**The authority over control of this manual is as follows:**

Preparation	Approval	Issue
Infection Prevention and Control Officer	Chairman Medical Superintendent	Quality Coordinator

The procedure manual with original signatures of the above on the title page is considered as 'Master Copy', and the photocopies of the master copy for the distribution are considered as 'Controlled Copy'.

**Distribution List of the Manual:**

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**Chapters**

1. Hospital Infection Control Committee
2. Policy on surveillance activities
3. Isolation Precaution
  - 3.1 Standard Precaution
  - 3.2 Transmission Based
  - 3.3 Hand Hygiene
  - 3.4 Personal Protective Equipment
4. Clinical Practice
  - 4.1 Aseptic Technique
  - 4.2 Urinary Catheter Care
  - 4.3 Wound Care
5. Prevention of Healthcare Associated Infections
  - 5.1 Urinary Tract Infection
6. Laboratory
7. Biomedical waste segregation Policy
8. Hospital Outbreak Management
9. Occupational Health and Safety
10. Environmental
  - 10.1 Infection Control During Construction and Renovation
  - 10.2 Policy on environmental services and house keeping
  - 10.3 Policy on laundry services
  - 10.4 Policy on Food Hygiene in Clinical Areas
11. Sterilization
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## Appendix 4

### 1. HOSPITAL INFECTION CONTROL COMMITTEE

#### 1.1 PURPOSE

To narrate the constitution, functioning and responsibilities of the Hospital Infection Control Committee.

#### 1.2 SCOPE

The responsibility of Infection Control at the Sarada Krishna Homoeopathic Medical college Hospital , Kulasekharam falls into the hands of HICC ( Hospital Infection Control Committee) whose primary duty is formulating and implementing policies to effectively manage infection control issues and outbreaks of infection.

#### 1.2.1 The HICC comprises of

#### 1.3 OBJECTIVES

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- 1.3.1 To advise and support the Infection Control team.
- 1.3.2 To develop policies, procedures and guidelines pertaining to cleaning, disinfection and sanitation
- 1.3.3 To provide guidelines concerning outbreak investigation, control of infectious diseases and isolation
- 1.3.4 To develop policies for waste disposal and disposal of 'sharps'
- 1.3.5 To ensure safe working conditions for Hospital staff and a safe environment for patients and visitors by laying down guidelines on Infection control and prevention.
- 1.3.6 To ensure dissemination of information on infection control and conduct periodic training programmes for all healthcare workers.
- 1.3.7 To assimilate surveillance data and keep the health workers updated on changing trends in epidemiology.
- 1.3.8 To review risks associated with new technologies, and monitor infectious risks of devices and products, prior to their approval for use.
- 1.3.11 To communicate and co-operate with other committees of the hospital with common interests such as Pharmacy and Therapeutics Committee and Safety Committee.

#### **1.4 INFECTION CONTROL TEAM (ICT)**

The Infection Control Team (ICT) is a small activity group, which is concerned with surveillance, prevention and control of infection in the hospital and which also provides day-to-day advice regarding infection related problems. The ICT will be responsible for review of notifications of communicable diseases and nosocomial infections and recommend appropriate actions.

##### **1.4.1 CONSTITUTION OF THE INFECTION CONTROL TEAM**

- .....Head of Department, Infection Prevention & Control Department
- .....Quality Control Manager
- .....Infection Control Coordinator
- .....Infection Control Nurse

**Other members invited as required.**

##### **1.4.2 INFECTION CONTROL TEAM MEMBERS**

###### **1.4.2.1 HOD - INFECTION PREVENTION & CONTROL DEPARTMENT (HOD-IPCD)**

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### 1.4.3 RESPONSIBILITIES OF INFECTION CONTROL TEAM

The Infection Control Team is more involved in the practical aspects of infection control.

The team is involved in

- 1.4.3.1 Collection of targeted surveillance data on nosocomial infection
- 1.4.3.2 Communicable disease surveillance and notification
- 1.4.3.3 Periodic environmental surveillance
- 1.4.3.4 Occupational health issues
- 1.4.3.5 Co-ordinate infection prevention training programme's for healthcare workers
- 1.4.3.6 Reviewing isolation policies and procedures and techniques throughout the hospital and advice nurses on proper patient assessment.
- 1.4.3.7 Review and advice on hospital practices related to infection control to HICC
- 1.4.3.8 Product evaluation
- 1.4.3.9 Special studies designed to investigate or lower infection rates in hospital
- 1.4.3.10 Epidemic investigation

### 1.4.4 MEETINGS

Both the HICC sub-committee's shall meet monthly or more frequently if the need arises. The minutes of the meetings will be maintained. The Infection Control Team meets on an informal basis more frequently (several times a week). A summary of the recommendations will be presented to the Medical Administrator periodically from the HICC.

## 2. POLICY ON SURVEILLANCE ACTIVITIES

### Introduction

Surveillance is one of the most important components of an effective infection control program. It is defined as the systematic collection, analysis, interpretation, and dissemination of data about the occurrence of HCAs in a definite patient population.

### Purpose of Surveillance

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1. To established and main a database describing endemic rates of HCAs. Once endemic rates are known then the occurrence of an epidemic can be detected when infection rates exceed baseline values.
2. To identify trends manifested over a finite period, such as shifts in microbial pathogen spectrum, infection rates, etc.
3. To provide continuous observation of HCAs cases for the purpose of prevention and control.
4. To obtain useful information for establishing priorities for infection control activities.
5. To quantitatively evaluate control measures effectiveness for a definite hospital population.
6. To enhance the role and authority of the infection control team in the hospital through participation in ward rounds, consultations and education of healthcare workers.

**Main components of Surveillance system**

**1. Definition of HCAI**

Infections that occur more than 48 hours after admission (It must be taken into account that different infections have different incubation periods, so that each occurrence must be evaluated individually to determine the relationship between its occurrence and hospitalization).

**2. Case Definition**

Each case definition must be standardized and consistent. The case definition used nationwide will be that of CDC definitions.

- i. Daily review of all positive culture results  
(Manually / Lab information system)
- ii. Informed by infection control link nurse when diagnosed by clinician.
- iii. Identified during ward rounds Infectious disease rounds.
- iv. Actively looking for cases in targeted surveillance and follow-up these case

**2.4 Types of Surveillance**

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**Continuous surveillance or periodic prevalence surveys** - Continuous surveillance is typically undertaken prospectively; it is the best way to establish trends and distribution of disease incidence. Intrinsic risk factors or proxies should also be collected to ensure that rates of HAI have not changed because of these factors rather than clinical practice. Intrinsic risk factors include age, gender, blood loss, smoking behavior, immune status, or underlying diseases/conditions that may increase the risk of infection. Simple measures of age and average length of stay (as a measure of severity of illness) may be useful proxy risk factors. Extrinsic risk factors are easier to control; these include hand hygiene.

Continuous surveillance can be active, passive, or a combination of both. Active surveillance involves daily visits to patient wards/care units to assess patients at-risk of HAI. It is expensive because it requires trained staff; therefore it is often performed passively using laboratory reports or reports from ward staff, who can enter data on cards for the IPC practitioner. Positive laboratory reports do not always indicate infection, and negative ones do not always mean infection is absent.

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### Surveillance for Hospital Acquired Infections

NHSN criteria guided surveillance is followed for –

#### 1. Device-associated Module:

- CAUTI – Catheter-associated urinary tract infection

### Hospital Acquired Infections (HAI)

Definition - For the purposes of NHSN surveillance in the acute care setting, a healthcare-associated infection (HAI) is a localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that was not present on admission to the acute care facility. An infection is considered an HAI if all elements of a CDC/NHSN site-specific infection criterion were first present together on or after the 3rd hospital day (day of hospital admission is day 1). For an HAI, an element of the infection criterion may be present during the first 2 hospital days as long as it is also present on or after day 3. All elements used to meet the infection criterion must occur within a timeframe that does not exceed a gap of 1 calendar day between elements. Infections occurring in infants that result from passage through the birth canal are considered HAIs if they meet the definition of HAI above.

The following infections are not considered healthcare associated:

- Infections associated with complications or extensions of infections already present on admission, unless a change in pathogen or symptoms strongly suggests the acquisition of a new infection.
- Reactivation of a latent infection (e.g., herpes zoster [shingles], herpes simplex, syphilis, or tuberculosis).

### Surveillance for Device Related Hospital Acquired Infections

The NHSN criteria will be followed for surveillance definitions, which will be updated as and when needed. Device-associated denominator data should be collected at the same time each day.

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### Catheter Associated Urinary Tract Infection (CAUTI)

Urinary tract infections (UTI) are defined using symptomatic urinary tract infection (SUTI) criteria or Asymptomatic Bacteremic UTI (ABUTI) criteria.

Date of event: For a UTI the date of event is the date when the last element used to meet the UTI infection criterion occurred.

Catheter-associated UTI (CAUTI): A UTI where an indwelling urinary catheter was in place for >2 calendar days when all elements of the UTI infection criterion were first present together, with day of device placement being Day 1,

*And*

An indwelling urinary catheter was in place on the date of event or the day before.

Algorithm for symptomatic criteria is given in appendix 1

## 3. ISOLATION PRECAUTION

### 3.1 Standard Precautions

The purpose of isolating patients is to prevent the transmission of micro-organisms from infected or colonized patients to other patients, hospital visitors, and health care workers (who may subsequently transmit to other patients or become infected or colonized themselves). Two-tier approach is currently employed. This includes STANDARD PRECAUTIONS (which applies to all patients) and TRANSMISSION-BASED PRECAUTIONS (which apply to patients with documented or suspected infection or colonization with certain micro-organisms).

Standard Precautions are designed to reduce the risk of transmission of micro-organisms from both recognized and unrecognized sources of infection in the hospital. Standard Precautions applies to all patients regardless of their diagnosis. Standard Precautions shall be implemented when contact with any of the following are anticipated:

#### Blood

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All body fluids, secretions and excretions, with the exception of sweat regardless of whether or not they contain visible blood.

Non-intact skin (this includes rashes) and Mucous membranes

### 3.1.1 Standard Precautions Requirements

1. Hand hygiene: (see section on hand hygiene) must be practiced promptly after touching blood, body fluids, secretions or excretions whether or not gloves were worn. In addition, hand hygiene must be practiced after gloves are removed and between patient contacts. Finally, hand hygiene must be practiced when tasks or procedures on the same patient involve different body sites in order to prevent cross contamination between body sites.
2. Gloves: (see section on PPE) clean gloves must be worn when touching blood, body fluids, excretions, secretions and contaminated items and when performing venipuncture.
3. Mask, eye protection & face shield (see section on PPE): must be worn during procedures or patient care activities that are expected to generate splashes or sprays of blood, body fluids, secretions and excretions. For example, suctioning, irrigating a wound, performing certain laboratory tests, etc.
4. Gown or Apron (see section on PPE): must be worn to protect skin and to prevent soiling of clothing during procedures or patient care activities that are expected to generate splashes or sprays of blood, body fluid, secretions and excretions.
5. Patient care equipment: (see chapter on Disinfectants & Sterilisation) must be cleaned according to protocol.
6. Linen: Place contaminated linen directly into a laundry bag in the isolation room/ area with minimal manipulation or agitation to avoid contamination of air, surfaces, and persons.
7. Waste management: (see chapter on Biomedical waste management policy) Waste

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management has to be done according to protocol.

**Management of spills**

**Blood and body fluids spills-cleaning procedure**

(Minor spills cleaning procedures-Spill less than 30 ml)

(Major spill –Spill more than 30 ml)

1. Place WET FLOOR sign next to the spill.
2. Wear disposable gloves and mask.
  - Place the spillage management kit next to the spill.
  - Spray adequate amount 1% Sodium Hypochlorite solution over the spill.
  - The spill should then be promptly confined by covering it with absorbent material like tissue paper.
  - Allow contact time for 10 minutes.
  - Remove all spilled blood / body fluids in yellow colour dustbin covers.
  - Clean and disinfect the area using adequate amount of regular disinfectant. Allow contact time as applicable.
  - Wait for the area to completely dry before removing the WET FLOOR sign.

**Contents of spillage management kit:**

1. Disposable apron.
2. Disposable mask.
3. Disposable gloves.
4. Disposal paper.
5. Cleaning agent (specific to that area)
6. 1% sodium Hypochlorite solution
7. Dust bin covers (Yellow)

(Note: Replenish all disposable items in the spill kit and ensure it is ready for future use)

8. Needles and other sharps: Sharps must not be passed directly from hand to hand and

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handling should be kept to a minimum.

9. Do not recap, bend, break, or hand-manipulate used needles. Needle should be burned with the help of needle burner and Place used sharps in puncture-resistant container.
10. Respiratory hygiene/cough etiquette: Instruct symptomatic persons and health care workers to cover their mouths/noses when coughing or sneezing, use and dispose of tissues, perform hand hygiene after hands have been in contact with respiratory secretions and wear surgical mask if tolerated or maintain spatial separation, >3 feet if possible.

### 3.2 Transmission-based

These precautions apply to selected patients, based on a suspected or confirmed clinical syndrome, a specific diagnosis, or colonization or infection with epidemiologically important organisms. These precautions are to be implemented in conjunction with standard precautions.

Three types of transmission-based precautions have been developed; airborne, droplet and contact. Few diseases (e.g. varicella, influenza) may require more than one isolation category. (See table 1 & 2). Essential elements of each isolation category are outlined below;

#### Airborne Precautions

Designed to prevent the transmission of diseases by droplet nuclei (particles <5 µm) or dust particles containing the infectious agent. These particles can remain suspended in the air and travel long distances. If the particles are inhaled, a susceptible host may develop infection. Airborne precautions are indicated for patients with documented or suspected tuberculosis (pulmonary or laryngeal), measles, varicella, or disseminated zoster.

**Patient Placement In descending order of preference:**

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	1. Single room (nursed with door closed) and en-suite bath
	2. Single room
	3. Cohort (not recommended unless absolutely necessary)
	- consult Physicians /microbiologists
<b>Respiratory protection</b>	Wear respiratory protection when entering the room of a patient with known or suspected infectious pulmonary tuberculosis. Susceptible persons should not enter the room of patients known or suspected to have measles or (rubeola) or varicella (chickenpox) if other immune caregivers are available. If susceptible persons must enter the room of a patient known or suspected to have measles (rubeola) or varicella, they should wear respiratory protection. Persons immune to measles (rubeola) or varicella need not wear respiratory protection
<b>Face shield/eye</b>	As per standard precautions protection (For procedures/activities likely to generate splashes/sprays of blood, body fluids, secretions and excretions)
<b>Gloves and Hand</b>	As per standard precautions washing (When touching blood, body fluids secretions, excretions, contaminated items, mucous membranes, non-intact skin)
<b>Gown</b>	As per standard precautions (For procedures/activities likely to generate splashes/sprays of blood, body fluids, secretions and excretions)
<b>Patient Transport</b>	Limit the movement and transport of the patient from the room to essential purposes only. If transport or movement is necessary, minimize patient dispersal of droplet nuclei by placing a surgical mask on the patient.
<b>Droplet Precautions</b>	Designed to prevent the transmission of diseases by large particle (droplet) (particles > 5 µm) or dust particles containing the infectious agent. Unlike droplet nuclei, droplets are larger, do not remain suspended in the air, and do not travel long distances. They are produced when the infected patient talks, coughs, or sneezes, and during some procedures.. A susceptible host may become infected if the infectious droplets land on the mucosal surfaces of the nose,

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	mouth, or eye.
<b>Patient Placement</b>	No special air handling or ventilation required In descending order of preference;
	1. Single room with en-suite bath
	2. Single room
	3. Cohort - place the patient in a room with a patient(s) who has active infection with the same microorganism but with no other infection.
	4. In the general ward, but maintain a spatial separation of at least 3 feet between infected patients and other patients and visitors. Place an isolation trolley/tray* at the entrance of the isolation zone.
<b>Respiratory protection</b>	Wear mask when working within 3 feet of the patient. If placed in a single room, wear mask before entering the room.
<b>Face shield/eye</b>	As per standard precautions protection (For procedures/activities likely to generate splashes/sprays of blood, body fluids, secretions and excretions)
<b>Gloves and Hand</b>	As per standard precautions washing (When touching blood, body fluids secretions, excretions, contaminated items, mucous membranes, non-intact skin)
<b>Gown</b>	In addition to Standard Precautions, wear a gown/apron (a clean, non-sterile gown/apron is adequate) when entering the room if you anticipate that your clothing will have substantial contact with the patient, environmental surfaces, or items in the patient's room, or if the patient is incontinent or has diarrhea, an ileostomy, a colostomy, or wound drainage not contained by a dressing. Remove the gown before leaving the patient's environment. After gown removal, ensure that clothing does not contact potentially contaminated environmental surfaces to

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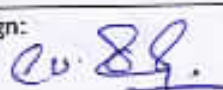


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	avoid transfer of microorganisms to other patients or environments
<b>Patient-Care Equipment</b>	Dedicate the use of noncritical patient-care equipment such as thermometer, stethoscope, BP set to a single patient (or cohort of patients infected or colonized with the pathogen requiring precautions). If these items must be shared, they should be cleaned and disinfected before reuse.
<b>Patient Transport</b>	Limit the movement and transport of the patient from the room to essential purposes only. If transport or movement is necessary, use clean linen. Cover all open wounds before transport

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<b>Patient Placement</b>	In descending order of preference; <ol style="list-style-type: none"><li>1. Single room (nursed with door closed) and en-suite bath</li><li>2. Single room</li><li>3. Cohort (not recommended unless absolutely necessary) -</li></ol>

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	consult Physicians /microbiologists
<b>Respiratory protection</b>	Wear respiratory protection when entering the room of a patient with known or suspected infectious pulmonary tuberculosis. Susceptible persons should not enter the room of patients known or suspected to have measles or (rubeola) or varicella (chickenpox) if other immune caregivers are available. If susceptible persons must enter the room of a patient known or suspected to have measles (rubeola) or varicella, they should wear respiratory protection. Persons immune to measles (rubeola) or varicella need not wear respiratory protection
<b>Face shield/eye protection</b>	As per standard precautions (For procedures/activities likely to generate splashes/sprays of blood, body fluids, secretions and excretions)
<b>Gloves and Hand washing</b>	As per standard precautions (When touching blood, body fluids secretions, excretions, contaminated items, mucous membranes, non-intact skin)
<b>Gown</b>	As per standard precautions (For procedures/activities likely to generate splashes/sprays of blood, body fluids, secretions and excretions)
<b>Patient Transport</b>	Limit the movement and transport of the patient from the room to essential purposes only. If transport or movement is necessary, minimize patient dispersal of droplet nuclei by placing a surgical mask on the patient.

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<b>Droplet Precautions</b>	
	Designed to prevent the transmission of diseases by large particle (droplet) (particles > 5 µm) or dust particles containing the infectious agent. Unlike droplet nuclei, droplets are larger, do not remain suspended in the air, and do not travel long distances. They are produced when the infected patient talks, coughs, or sneezes, and during some procedures (e.g., suctioning and bronchoscopy). A susceptible host may become infected if the infectious droplets land on the mucosal surfaces of the nose, mouth, or eye.
<b>Patient Placement</b>	No special air handling or ventilation required In descending order of preference; 1. Single room 2. Cohort - place the patient in a room with a patient(s) who has active infection with the same microorganism but with no other infection. 3. In the general ward, but maintain a spatial separation of at least 3 feet between infected patients and other patients and visitors. Place an isolation trolley/tray* at the entrance of the isolation zone.
<b>Respiratory protection</b>	Wear mask when working within 3 feet of the patient. If placed in a single room, wear mask before entering the room.
<b>Face shield/eye protection</b>	As per standard precautions (For procedures/activities likely to generate splashes/sprays of blood, body fluids, secretions and excretions)
<b>Gloves and Hand washing</b>	As per standard precautions (When touching blood, body fluids secretions, excretions,

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	contaminated items, mucous membranes, non intact skin)
<b>Gown</b>	As per standard precautions (For procedures/activities likely to generate splashes/sprays of blood, body fluids, secretions and excretions)
<b>Patient Transport</b>	Limit the movement and transport of the patient from the room to essential purposes only. If transport or movement is necessary, minimize patient dispersal of droplet nuclei by placing a surgical mask on the patient.

**Contact Precautions**

Used to prevent the transmission of epidemiologically important organisms from an infected or colonized patient through direct (touching the patient) or indirect (touching contaminated objects or surfaces in the patient's environment) contact.

<b>Patient Placement</b>	In descending order of preference; 1. Single room 2. Cohort - place the patient in a room with a patient(s) who has active infection with the same micro organism but with no other infection. 3. In the general ward with an isolation tray/trolley* beside the bed.
<b>Respiratory protection</b>	As per standard precautions (For procedures/activities likely to generate splashes/sprays of blood, body fluids, secretions and excretions)
<b>Face shield/eye protection</b>	As per standard precautions

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	(For procedures/activities likely to generate splashes/sprays of blood, body fluids, secretions and excretions)
<b>Gloves and Hand washing</b>	<p>In addition to Standard Precautions, wear gloves (clean, non-sterile gloves are adequate) when entering the room.</p> <p>During the course of providing care for a patient, change gloves after having contact with infective material that may contain high concentrations of microorganisms (fecal material and wound drainage).</p> <p>Remove gloves before leaving the patient's environment and wash hands immediately with soap or a waterless antiseptic agent.</p>
	After glove removal and hand washing, ensure that hands do not touch potentially contaminated environmental surfaces or items in the patient's room to avoid transfer of microorganisms to other patients or environments.
<b>Gown</b>	<p>In addition to Standard Precautions, wear a gown/apron (a clean, non-sterile gown/apron is adequate) when entering the room if you anticipate that your clothing will have substantial contact with the patient, environmental surfaces, or items in the patient's room, or if the patient is incontinent or has diarrhea, an ileostomy, a colostomy, or wound drainage not contained by a dressing.</p> <p>Remove the gown before leaving the patient's environment.</p> <p>After gown removal, ensure that clothing does not contact potentially contaminated environmental surfaces to avoid transfer of microorganisms to other patients or environments</p>

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<b>Patient-Care Equipment</b>	Dedicate the use of noncritical patient-care equipment such as thermometer, stethoscope, BP set to a single patient (or cohort of patients infected or colonized with the pathogen requiring precautions). If these items must be shared, they should be cleaned and disinfected before reuse.
<b>Patient Transport</b>	Limit the movement and transport of the patient from the room to essential purposes only. If transport or movement is necessary, use clean linen. Cover all open wounds before transport.

Isolation tray/trolley must contain the following items: nonsterile gloves, nonsterile gowns, surgical masks, thermometer, BP set, stethoscope, alcohol hand rub.

**Dedicated Isolation Room:**

**Room No:311**

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**Table: 1 Isolation precautions for various infections**

Diseases	Isolation Precautions	Duration of Isolation
<b>Abscess</b> <ul style="list-style-type: none"><li>• Dressing covers and contains discharge adequately.</li><li>• No dressing or dressing does not contain discharge adequately.</li></ul>	Standard	
<b>HIV / AIDS</b>	Standard	
<b>Amoebiasis</b>	Standard	
<b>Dengue</b>	Standard	
<b>Candidiasis</b>	Standard	
<b>Cryptococcosis</b>	Standard	
<b>Diphtheria - Pharyngeal</b>	Droplet	Until off antibiotics and 2 cultures taken at least 24 hours apart are

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		negative
<b>Endometritis</b>	Standard	
<b>Enteroviral infections</b>	Standard	
<b>Epiglottitis, due to Haemophilus influenzae</b>	Droplet	Until 24 hours after starting effective therapy
<b>Clostridium difficile enterocolitis</b>	Contact	Duration of illness
<b>Gastroenteritis</b> • If incontinent or diapered	Standard	Duration of illness
	Contact	
<b>Hepatitis A</b> • If incontinent or diapered	Standard	In children 3 to 14 years of age maintain precautions until 2 weeks after onset of symptoms; and in others, until 1 week after onset of symptoms.
	Contact	
<b>Hepatitis B, HbsAg Positive</b>	Standard	
<b>Hepatitis C, E, and other unspecified non-A, non-B</b>	Standard	
<b>Herpes simplex</b> • Encephalitis •Mucocutaneous, Primary or disseminated •Mucocutaneous, Recurrent (skin, genital, oral)	Standard	
	Contact	Duration of illness

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	Standard	
<b>Herpes Zoster (Varicella-Zoster)</b> <ul style="list-style-type: none"><li>• Localised in normal host</li><li>• Disseminated</li><li>• Localised in Immunocompromised patient</li></ul>	Contact	Duration of illness. Persons susceptible to varicella (chicken pox) are also at risk for developing varicella when exposed to patients with herpes zoster lesions; therefore, susceptibles should not enter the room if other immune caregivers are available.
	Airborne & Contact	

Diseases	Isolation Precautions	Duration of Isolation
Histoplasmosis	Standard	
Impetigo	Contact	Until 24 hours after starting effective therapy
Infectious Mononucleosis	Standard	
Influenza	Droplet	Duration of illness
Legionnaires' disease	Standard	
Leptospirosis	Standard	
Lice (Pediculosis)	Contact	
Malaria	Standard	
Measles	Airborne	Duration of illness

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Melioidosis	Standard	
<b>Meningitis</b> <ul style="list-style-type: none"><li>• Haemophilus influenzae, <i>known or suspected</i></li><li>• Meningococcal, <i>known or suspected</i></li><li>• Other bacterial</li><li>• Aseptic</li><li>• Fungal</li></ul>	Droplet	Until 24 hours after starting effective therapy
<b>Meningococemia</b>	Droplet	Until 24 hours after starting effective therapy

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<b>Mumps</b>	Droplet	For 9 days after onset of swelling
<b>Mycobacteria, Atypical</b> •Pneumonia •Wound	Standard	
<b>Mycobacterium tuberculosis</b>	Airborne & Droplet	2 weeks after start of treatment
<b>MRO/MRSA</b> •Wound bacteremia •Pneumonia	Contact Droplet	Until eradicated Cover wound with adequate dressing Wear mask
<b>Nocardia</b>	Standard	
<b>Pertusis (Whooping cough)</b>	Droplet	Maintain precautions until 5 days after patient is placed on effective therapy
<b>Pneumonia</b> •Atypical Myoplasma Pneumonia •Pneumocystis carinii	Droplet Standard	Duration of illness Avoid placement in the same room with an immunocompromised patient
<b>Diseases</b>	<b>Isolation</b> <b>Precautions</b>	<b>Duration of Isolation</b>
•Adenovirus/RSV/Influenza •Chlamydia •Other Bacterial	Droplet & Contact Standard Standard	Duration of illness
<b>Poliomyelitis</b>	Standard	
<b>Rabies</b>	Standard	
<b>Rheumatic fever</b>	Standard	
<b>Rubella (German measles)</b>	Droplet	Until 7 days after the onset of rash

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Scabies	Contact	
<b>Streptococcal disease (Group A streptococcus) Skin, wound, burns</b> • No dressing or dressing does not contain discharge adequately • Dressing covers and contains discharge adequately	Contact	Until 24 hours after starting effective therapy
Syphilis	Standard	
Tetanus	Standard	
Toxic shock syndrome (Staph)	Standard	
Toxoplasmosis	Standard	
<b>Typhoid (Salmonella Typhi)</b> • If incontinent or diapered	Standard Contact	
Typhus	Standard	
Urinary tract infection including pyelonephritis	Standard	
Varicella (chicken pox)	Airborne & Contact	Maintain precautions until all lesions are crusted. The average incubation period for varicella is 10 to 21 days. Discharge exposed but susceptible patients if possible. Place exposed susceptible patients on Airborne Precautions beginning 10 days after exposure and continuing until 21 days after last exposure (up to 28 days if VZIG has been given). Susceptible persons should not enter the room of patients on precautions if other immune caregivers are available.
Wound Infections	Standard	

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<ul style="list-style-type: none"> <li>• Dressing covers and contains discharge adequately</li> <li>• No dressing or dressing does not contain discharge adequately</li> </ul>	Contact	
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**Table 2: Clinical Syndromes Requiring Empiric Precautions to Prevent Transmission Pending Confirmation of Diagnosis**

Clinical Syndrome	Potential Pathogens	Empiric Precautions
<b>Diarrhea</b>		
Acute diarrhea in a incontinent/ diapered patient	Enteric Pathogens	Contact
Diarrhea in a patient with history of recent antibiotic use	<i>Clostridium difficile</i>	Contact
<b>Meningitis</b>		
Meningitis	<i>Neisseria Meningitidis</i>	Droplet
<b>Generalised exanths/rash</b>		
Petechial/echymotic with fever Vesicular Erythematous maculopapular with coryza and fever	<i>Neisseria Meningitidis</i> Varicella Measles	Droplet Airborne & Contact Airborne
<b>Respiratory Infections</b>		
Atypical pneumonia CXR suggestive of Pulmonary tuberculosis	Influenza Mycobacterium Tuberculosis	Droplet Airborne
<b>Risk of multidrug resistant organism</b>		
History of infection or colonization with multidrug resistant organism	Resistant Bacteria	Contact
<b>Skin or Wound Infection</b>		
Abscess or draining wound that cannot be covered	<i>Staphylococcus aureus</i> , Group A streptococcus	Contact

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### 3.2.1 Practice of isolation

#### 1. Patient placement

- Appropriate patient placement is a significant component of isolation precautions.
- Determine patient placement based on the following principles:
  - Route(s) of transmission of the infectious agent
  - Risk factors for transmission in the infected patient
  - Risk factors for adverse outcomes resulting from healthcare-associated infection in other patients in the area.
  - Availability of single-patient rooms
- Give priority to the following types of patients /infections when single rooms are scarce
- Source patient has poor hygienic habits, contaminates the environment, or cannot be expected to assist in maintaining infection control precautions to limit transmission of microorganisms (i.e., infants, children, and patients with altered mental status).
- Source patient has uncontained secretions, excretions or wound drainage. For patients with obligate or preferential airborne infections which include pulmonary tuberculosis, measles and chickenpox.
- Cohorting: When single rooms are scarce patients with epidemiological and clinical information suggestive of a similar diagnosis may be allowed to share a room, but with a spatial separation of e" 1 m.
- In cohorted areas minimize patient mingling.
- For airborne/droplet transmission ask patients to wear surgical mask and ensure room is well ventilated.
- Increase the cleaning of common areas including bath / toilet facilities (e.g. 4-6 hourly).
- Place alcohol hand rubs beside each patient bed.
- Avoid sharing of equipment, but if unavoidable, ensure that reusable equipment is appropriately disinfected between patients

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- Isolation trolley/tray with all the necessary PPE must be available at the entrance of the cohorted area.
- Assigning or cohorting healthcare personnel to care only for patients infected or colonized with a single target pathogen limits further transmission of infectious agents to uninfected patients but is difficult to achieve in the face of current staffing shortages in hospitals and in non-hospital healthcare sites.
- For critical / seriously ill patients: patients who will require close monitoring, isolation requirements should not compromise clinical care. For such patients the options are
  - Arrange for intensive monitoring (equipment/personnel with appropriate PPEs) to be placed in the isolation facility or
  - Bring patients out into open area with cohorting requirements (only if the mode of potential spread is contact / droplet)

## **2. Signs, Isolation tray/trolley**

- Place appropriate signs on the door/ patient screen/bed stand to indicate the type of isolation precaution required for the patient.
- The case records, X-rays and observation charts must not be taken into the isolation room or cohorted areas.
- An isolation tray/trolley is required to be placed outside each isolation room/ area, unless an ante room with adequate storage facilities is available.

## **3. Equipment /Supplies**

- As far as possible, dedicate the use of non-critical patient care equipments such as thermometer, BP set, stethoscope to a single patient.
- Non-critical items, such as commodes, intravenous pumps, and BP sets, must be thoroughly cleaned and disinfected prior to use on another patient
- All disposable supplies or items that cannot be cleaned must be discarded when the patient is discharged from the isolation rooms.

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#### 4. Visitor Policy for Infection Control

The support offered to patients by visitors is of great importance in their recovery and wellbeing. A few simple principles will ensure the visitor's and the patient's safety from exposure to communicable diseases.

- Visitors are discouraged from entering isolation rooms of patients in airborne and droplet isolation. They are expected to wear the same PPE that a health care worker would wear performing the same activity.
- All visitors who are involved in caring of patients should be educated on standard precaution, which include use of PPE and hand hygiene. This applies to activities such as such as changing bed linen, bathing or toileting.
- Patients and family member/guardian must be counseled and given emotional support.
- In outbreak situations unnecessary visits should be discouraged. Those who choose to visit should wash their hands as they enter and leave the area and comply with all other hygiene practices in place. Alternative ways of communicating with the patient during this time include telephone and written notes.
- Visitors with uncontrolled symptoms of coughing, sneezing, or diarrhea should refrain from visiting.

#### 5. Dishes, Glasses, Cups, Eating utensils and Medications

- No special precautions are needed for dishes, glasses, cups, or eating utensils. The combination of hot water and detergents used in hospital dishwashers is sufficient to decontaminate dishes, glasses, cups, and eating utensils. If hot water or adequate conditions for cleaning utensils and dishes are not available, disposable products should be used.
- Any medications/IV solutions, tube feedings or baby formula taken into an isolation room that is not used must be discarded when patient is discharged.

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### 6. Transportation of patients

- Limit the movement and transport of patients who require isolation and ensure that such patients leave their rooms/isolated areas only for essential purposes.
- When patient transport is necessary, it is important that, appropriate barriers (e.g., masks, impervious dressings) are worn or used by the patient to reduce the opportunity for transmission of pertinent microorganisms to other patients, personnel, and visitors and to reduce contamination of the environment.
- Any patient with a draining wound or skin lesions should be dressed with a clean hospital gown before leaving the room. Cover all open wounds before transport.
- Personnel in the area to which the patient is to be taken must be notified of the impending arrival of the patient and of the precautions to be used to reduce the risk of transmission of infectious micro-organisms.
- Procedures for these patients should be scheduled at times when they can be performed rapidly and when waiting areas are less crowded
- Use routes of transport that minimize exposures of staff, other patients and visitors

### 7. Cleaning

Isolation rooms are to be cleaned daily.

- Cleaning MUST precede disinfection. Items and surfaces cannot be disinfected if they are not first cleaned of organic matter (patient excretions, secretions, dirt, soil, etc).
- To avoid possible aerosolization of ARD pathogens, damp cleaning (moistened cloth) rather than dry dusting or sweeping should be performed
- Horizontal surfaces and dust collecting areas, sites in the immediate patient environment, sites HCWs often contact should be cleaned regularly and on discharge
- To facilitate daily cleaning, keep areas around the patient free of unnecessary supplies

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and equipment.

- Do not spray (i.e. fog) occupied or unoccupied rooms with disinfectant. This is a potentially dangerous practice that has no proven disease control benefit
- To facilitate cleaning, and to reduce the potential for aerosolization caused by use of a vacuum cleaner, isolate patients in uncarpeted rooms/areas,
- Upon discharge of the patient, isolation rooms will receive terminal cleaning.

### 3.3 Hand Hygiene

#### 3.3.1 Introduction

Pathogenic organisms from colonized and infected patients (and sometimes from the environment) transiently contaminate the hands of staff during normal clinical activities and can then be transferred to other patients. Hand transmission is one of the most important methods of spread of infectious agents in health care facilities. Proper hand hygiene is an effective method for preventing the transfer of microbes between staff and patients. Increasing in hand-washing compliance by 1.5 - 2 fold would result in a 25-50% decrease in the incidence of healthcare associated infections.

#### 3.3.2 Performing Hand Hygiene

- Soap and water is as effective as hand washing preparations containing antimicrobial agents for decontaminating hands and removing transient microorganisms.
- However, water and preparations containing antimicrobial agents are more effective in removing resident microorganisms than those without an antimicrobial agent. Kill residents only for surgery.
- Alcohol-based hand rubs are more effective in destroying transient microorganisms than

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- antimicrobial hand washing agents or soap and water, and give a greater initial reduction in hand flora. Alcohol-based hand rubs with emollients added will cause less skin irritation and drying to hands (1-3% glycerol). However hand rubs containing alcohol alone as the active ingredient have no residual effect. Hands that are visibly soiled or potentially grossly contaminated with dirt or organic material must be washed with liquid soap and water.
- Liquid products should be stored in closed containers and dispensed from disposable containers or containers which can be thoroughly washed and dried before refilling. Do not add soap to a partially empty soap dispenser.
- When bar soaps are not to be used.
- Gloves should not be regarded as a substitute for hand hygiene. A glove is not always a complete impermeable barrier (20-30% of surgical gloves are punctured during surgery). An alcoholic rub or hand wash should be performed after removing gloves and before sterile gloves are worn.
- Proper technique for decontamination of hands is probably of greater importance than the agent used. See figures for the technique of hand washing and antisepsis.

### 3.3.3 WHO's Five Moments in Hand Hygiene

1. Before and after having direct contact with patients:

A single act of hand hygiene (with an alcohol hand-rub or an antimicrobial soap) after one

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patient and before the next patient suffices to decontaminate your hands if you are not re-contaminating your hands in-between patients (as in talking on the telephone, handling objects, etc.). A good rule of thumb is that if you apply an alcohol hand-rub as you leave one patient and are still rubbing your hands together as you arrive at the next patient then there is no need to repeat hand antisepsis.

2. Before handling an invasive device for patient care, regardless of whether or not gloves are used.
3. After contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings.
4. If moving from a contaminated body site to a clean body site during patient.
5. After contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient. Perform hand wash when hands are visibly dirty. Wash hands with plain or antimicrobial soap and water or rub hands with an alcohol based formulation before handling medication or preparing food.

### 3.3.4 Surgical scrub

1. Remove rings, wrist-watch, and bracelets before beginning the surgical hand preparation
2. When performing surgical hand antisepsis using an antimicrobial soap, long scrub times are not necessary. Recommended duration in 2-3 minutes but not exceeding 5 minutes and should include wrists and forearms.
3. If hands are visibly soiled, wash hands with plain soap before surgical hand scrub.

### 3.3.5 Institutional responsibilities

1. Make improved hand-hygiene an institutional priority and provide administrative and financial support.

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2. Provide an alcohol-based hand-rub at the entrance to the patient's room and/or at the bedside, as well as other convenient locations. Placing alcohol-based hand rub dispensers near the point of care has been associated with increased compliance by health care workers with recommended hand hygiene procedures.
3. To provide an alternative to alcohol-based hand-rubs for decontaminating hands, provide antimicrobial soap in all patient care areas where soap is provided (i.e. all sinks with a soap dispenser).

The Infection Control Nurse monitors health care workers' adherence to hand-hygiene practices especially in the critical areas and provide the feedback regarding the workers'

### **The 5 Moments in Hand Hygiene**





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## How to Hand wash?

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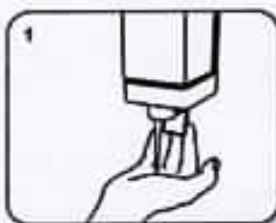


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Wet hands with water



apply enough soap to cover all  
hand surfaces.



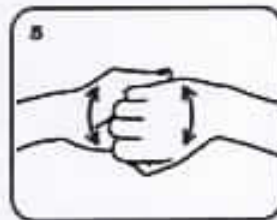
Rub hands palm to palm



right palm over left dorsum  
with interlaced fingers  
and vice versa



palm to palm with fingers  
interlaced



backs of fingers to opposing  
palms with fingers interlocked



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



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



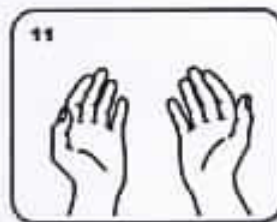
Rinse hands with water



dry thoroughly with a single  
use towel



use towel to turn off faucet



...and your hands are safe.

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# How to Handrub?

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

**⌚** Duration of the entire procedure: 20-30 seconds

1a



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

1b



2



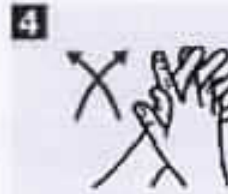
Rub hands palm to palm.

3



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

4



Palm to palm with fingers interlaced.

5



Backs of fingers to opposing palms with fingers interlocked.

6



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

7



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

8



Once dry, your hands are safe.



World Health  
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Patient Safety

A World Standard for Safer Health Care

SAVE LIVES

Clean Your Hands

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### 3.4 Personal Protective Equipment (PPE)

Primary uses of PPE are to protect staff and reduce opportunities for transmission of microorganisms in hospital. Select protective equipment on the basis of an assessment of the risk of transmission of microorganisms to the patient, and the risk of contamination of health care practitioners' clothing and skin by patients' blood, body fluids, secretions and excretions. This auditing is done using the WHO hand hygiene audit tool.

#### 3.4.1 Gloves

Glove wearing by HCWs is recommended for two main reasons:

1. To prevent microorganisms which may be infecting, commensally carried, or transiently present on HCWs' hands from being transmitted to patients and from one patient to another; and
2. To reduce the risk of HCWs acquiring infections from patients.

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**STERILE GLOVES INDICATED**

Any surgical procedure; vaginal delivery; invasive radiological procedures; performing vascular access and procedures (central lines); preparing total parenteral nutrition and chemotherapeutic agents.

**CLEAN GLOVES INDICATED IN CLINICAL SITUATIONS**

**Potential for touching blood body fluids, secretions, excretions and items visibly soiled by body fluids.**

**DIRECT PATIENT EXPOSURE:** Contact with blood; contact with mucous membrane and non-intact skin; potential presence of highly infectious and dangerous organism; epidemic or emergency situations; IV insertion and removal; drawing blood, discontinuation of venous line; pelvic and vaginal examination; suctioning non closed systems of endotracheal tubes

**INDIRECT PATIENT EXPOSURE:** Emptying xxx basins, handling/cleaning instruments; handling waste; cleaning up spills of body fluid.

**GLOVES NOT INDICATED (except for contact precautions)**

**No potential exposure to blood or body fluids or contaminated environment**

**DIRECT PATIENT EXPOSURE:** Taking blood pressure, temperature and pulse, performing SC and IM injections; bathing and dressing the patient; transporting patient; caring for eyes and ears (without secretions); any vascular line manipulation in absence of blood leakage.

**Indirect patient exposure:** Using telephone, writing in the patient chart; giving oral medications; distributing or collecting patient dietary trays, removing and replacing linen for patient bed; placing non invasive ventilation equipment and oxygen cannula, moving patient furniture.

Gloves do not replace the need for hand washing. Contamination of the hands may occur when gloves are removed and some gloves have small perforations that may allow contamination of the hands.

Gloves must be discarded after each care activity for which they were worn in order to prevent the transmission of microorganisms to other sites in that individual or to other patients. Wear gloves only when indicated - otherwise they become a major risk for germ transmission.

**3.4.2 Isolation Gowns and Aprons**

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1. Clinical and laboratory coats or jackets worn over personal clothing for comfort and/or purposes of identity are not considered PPE.
2. Disposable plastic aprons should be worn when there is a risk that clothing or uniform may become exposed to blood, body fluids, secretions and excretions, with the exception of sweat.
3. Full body gowns need only be used where there is the possibility of extensive splashing of blood, body fluids, secretions or excretions and should be fluid repellent.
4. However, when contact precautions are used to prevent transmission of an MDRO, donning of both gown and gloves prior to room entry, regardless of the anticipated level of contact, may reduce unanticipated contact with an MDRO in the environment.
5. The practice of routine gowning upon entrance into an intensive care or other high-risk area does not prevent colonization or infection of patients.
6. Removal of isolation gowns before leaving the patient care area is advised to prevent opportunities for possible contamination outside the patient's room.

### **3.4.3 Face Protection: Masks, Goggles, Face Shields**

1. Masks are used for three primary purposes in healthcare settings:
  - a) To protect health care workers from contact with infectious material from patients e.g. respiratory secretions and sprays of blood or body fluids as defined in standard and droplet precautions.
  - b) Placed on healthcare workers when engaged in procedures requiring sterile technique to protect patients from exposure to infectious agents carried in a healthcare worker's mouth or nose,
  - c) Placed on coughing patients to limit potential dissemination of infectious respiratory secretions from the patient to others (i.e: Respiratory Hygiene/Cough Etiquette).
2. Procedures that generate splashes or sprays of blood, body fluids, secretions, or excretions (e.g., endotracheal suctioning, bronchoscopy, invasive vascular procedures) require either a face shield (disposable or reusable) or mask and goggles
3. Two types of mask available, the surgical and particulate respirator (N95) used to prevent inhalation of small particles that may contain infectious agents transmitted via the airborne route.
4. Personal eyeglasses and contact lenses are NOT considered adequate eye protection.
5. Disposable or non-disposable face shields may be used as an alternative to goggles. As compared with goggles, a face shield can provide protection to other facial areas in addition to the eyes.
6. Removal of a face shield, goggles and mask can be performed safely after gloves have been removed, and hand hygiene performed.

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### 3.4.4 Respiratory protection

1. Personal respiratory protection is required when dealing with micro-organisms that spread by airborne route. Respirators are also currently recommended to be worn during the performance of aerosol-generating procedures (e.g: intubation, bronchoscopy, suctioning) patients with H1N1 infection, avian influenza, pandemic influenza and other unknown respiratory syndromes. In these instances, surgical masks are not effective protection.
3. Respiratory protection currently requires the use of a respirator with N95 or higher filtration.

#### 3.4.4.1 Fit test

1. All health care facilities using these respirators must have a mechanism to regularly conduct risk assessment to validate the need for respiratory protection to the staff, and conduct periodic training on correct usage of the respirators.
2. Fit testing: A fit test is used to determine which respirator fits the user adequately and to ensure that the user knows when the respirator fits properly.
3. When selecting particulate respirators, N95, or equivalent model with inherently good fit characteristics (i.e., adequate fit to > 95% of wearers) are preferred and could theoretically relieve the need for fit testing.
4. A user-seal check (formerly called a "fit check") should be performed by the wearer of a respirator each time a respirator is donned to minimize air leakage around the face piece. See figure. Caps and boots covers are not very useful.

### 3.4.5 Respiratory hygiene/cough etiquette

Controlling the spread of pathogens from infected patients (source control) is key to avoid transmission to unprotected contacts. For diseases transmitted through large droplets and/or droplet nuclei, respiratory hygiene/cough etiquette should be applied by all individuals with respiratory symptoms.

All individuals (HCWs, patients and visitors) with signs and symptoms of a respiratory infection should:

- Cover their mouth and nose when coughing/sneezing;
- Use tissues, handkerchiefs, cloth masks or medical masks if available, as source control to contain respiratory secretions, and dispose of them into the waste containers;
- Use a medical mask on a coughing/sneezing person when tolerated and appropriate; and perform hand hygiene.

Hospital should promote respiratory hygiene/cough etiquette:

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- Promote the use of respiratory hygiene/cough etiquette by all HCWs, patients and family members with acute febrile respiratory illness;
- Educate HCWs, patients, family members, and visitors on the importance of containing respiratory aerosols and secretions to help prevent the transmission of respiratory diseases;
- Consider providing resources for hand hygiene (e.g. dispensers of alcohol-based hand rubs, hand-washing supplies) and respiratory hygiene (e.g. tissues); areas of gathering, such as waiting rooms, should be prioritized.

**Sequence of a particular respirator seal check**

- 1 Cup the respirator in your hand with the nosepiece at your fingertips allowing the headbands to hang freely below your hand
- 2 Position your respirator under your chin with the nosepiece up
- 3 Pull the top strap over your head resting it high at the back of your head. Pull the bottom strap over your head and position it around the neck below the ears
- 4 Place fingertips of both hands at the top of the metal nosepiece.  
Mould the nosepiece (USING TWO FINGERS OF EACH HAND) to the shape of your nose. Pinching the nosepiece using one hand may result in less effective respirator performance
- 5 Cover the front of the respirator with both hands, being careful not to disturb the position of respirator

5A Positive seal check	5B Negative seal check
- Exhale sharply. A positive pressure inside the respirator = no leakage. If leakage, adjust position and/or tension straps. Retest the seal. - Repeat the steps until respirator is sealed properly	- Inhale deeply. If no leakage, negative pressure will make respirator cling to your face. - Leakage will result in loss of negative pressure in the respirator due to air entering through gaps in the seal

**Putting on PPE (when all PPE items are needed)**

- 1 - Identify hazards & manage risk. Gather the necessary PPE.  
- Plan where to put on & take off PPE.  
- Do you know how you will deal with waste?
- 2 - Put on a gown
- 3 - Put on particulate respirator or medical mask; perform user seal check if using a respirator
- 4 - Put on eye protection e.g. face shield/goggles (consider anti-fog drops or fog resistant goggles)

Caps are optional: if worn, put on after eye protection

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5 - Put on gloves (over cuffs)

**Taking off PPE**

- 1 - Avoid contamination of self, others & the environment
  - Remove the most heavily contaminated item first
  - Remove gloves & gown:
  - peel off gown & gloves and roll inside, out - dispose gloves and gown safely
- 2 Perform hand hygiene
- 3 - Remove cap (if worn)
  - Remove goggles from behind
  - Put goggles in a separate container for reprocessing
- 4 - Remove respirator from behind
- 5 - Perform hand hygiene

**SEQUENCE OF A PARTICULAR RESPIRATOR SEAL CHECK**

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1 Cup the respirator in your hand with the nosepiece at your fingertips allowing the headbands to hang freely below your hand



2 Position your respirator under your chin with the nosepiece up



3 Pull the top strap over your head resting it high at the back of your head. Pull the bottom strap over your head and position it around the neck below the ears



4 Place fingertips of both hands at the top of the metal nosepiece. Mould the nosepiece (USING TWO FINGERS OF EACH HAND) to the shape of your nose. Pinching the nosepiece using one hand may result in less effective respirator performance



5. Cover the front of the respirator with both hands, being careful not to disturb the position of respirator

5A) Positive seal check - Exhale sharply. A positive pressure inside the respirator = no leakage. If leakage, adjust position and/or tension straps. Retest the seal. Repeat the steps until respirator is sealed properly

5B) Negative seal check - Inhale deeply. If no leakage negative pressure will make respirator cling to your face. - Leakage will result in loss of negative pressure in the respirator due to air entering through gaps in the seal

**Putting on PPE (when all PPE items are needed)**

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1. - Identify hazards & manage risk. Gather the necessary PPE.  
- Plan where to put on & take off PPE.  
- Do you know how you will deal with waste?



2 Put on a gown



- 3 Put on particulate respirator or medical mask; perform user seal check if using a respirator



4 Put on eye protection e.g. face shield/goggles (consider anti-fog drops or fog resistant goggles) Caps are optional : if worn, put on after eye protection



- 5 Put on gloves (over cuffs)

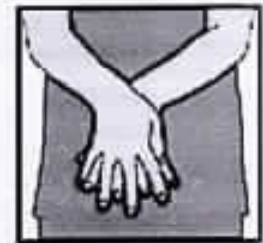
**Taking off PPE**



- 1) - Avoid contamination of self, others & the environment  
- Remove the most heavily contaminated item first  
- Remove gloves & gown:  
- peel off gown & gloves and roll inside, out - dispose gloves and gown safely



2) Perform hand hygiene



5) Perform hand hygiene



- 3) - Remove cap (if worn)  
- Remove goggles from behind  
- Put goggles in a separate container for reprocessing



4) Remove respirator from behind

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# PERSONAL PROTECTIVE EQUIPMENT (PPE)

## For Infectious Diseases Requiring Airborne Infection Isolation & Contact Precautions

### PROCEDURE FOR DONNING PPE:

- ✓ Decontaminate hands with an alcohol-based hand rub or wash with antimicrobial soap/water
- ✓ Put on gown

- ✓ Put on approved respirator (N-95 or higher)
- ✓ Put on a face shield or goggles (wear goggles for aerosol-generating procedures)

- ✓ Put on hair cover (if recommended or required)
- ✓ Put on gloves

### PROCEDURE FOR REMOVING PPE:

Avoid contaminating your hands while removing PPE. If hands do become contaminated during the procedure at any time, DECONTAMINATE immediately with alcohol-based hand rub or antimicrobial soap. Never touch face gear without first decontaminating hands or re-gloving with a clean pair of gloves. Use biohazardous trash container for used PPE.

1. Remove gloves  
Peel off and place in  
waste bin.  
Wipe fingers inside  
out of outer glove  
and peel off, inside out.



2. Remove gown  
Be careful not to touch  
the front, contaminated  
area. Slide all straps at  
back of gown, slide hands  
under back edge  
at the neck and pull off  
towards back and  
roll into as it is  
removed. Discard in  
appropriate receptacle.



3. Decontaminate  
hands  
Use an alcohol-based  
hand rub or  
antimicrobial soap.



4. Put on clean  
pair of gloves



5. Remove face  
shield and/or  
goggles  
Avoid touching front  
and contact with eyes.



6. Remove head  
COVER  
Remove by twisting  
top edge under chin,  
to 15° off head.



7. Remove RESPIRATOR  
Remove by straps. Avoid  
touching front and  
contact with eyes.



8. Remove gloves  
and decontaminate  
hands



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## 4. CLINICAL PRACTICE

### 4.1 Aseptic Technique

The aseptic technique is a method to prevent transmission of microorganisms from various sources to a patient by creating a microorganism-free environment, maintaining sterility of instruments and preventing microbial contamination during various clinical procedures performed on a patient. The components of the aseptic technique are as follows;

#### 4.1.1 Non-touch technique

1. Non-touch technique is the most essential part of the aseptic technique.
2. The most effective way of maintaining sterility of sterilized instruments and other items
3. Contact with the ungloved hand and any other non-sterilized object renders the instrument or item non-sterile.
4. Work processes need to be coordinated so that the sterile or disinfected item or instrument does not come into contact with non-sterile items.

#### 4.1.2 Minimizing Microorganisms on Hands By Hand Hygiene (Refer section on hand hygiene)

Hand hygiene is a must before and after performing any clinical procedure. This practice maintains the cleanliness of the HCW hands, at all times, by reducing the quantity of bacteria on them.

#### 4.1.3 Rendering the Hand Sterile by Wearing Sterile Gloves

1. Sterilized gloves are worn to render the hand sterile since hand hygiene alone will only reduce the number of bacteria on it.
2. During the gloving process, touch only the inside surface of the glove with the non-gloved hand. The outside of the glove can be touched with the gloved hand.
3. Once gloved, do not touch non-sterile areas or articles with the gloved hand. Remember

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that the patient's skin is non-sterile. If the glove is punctured or torn, replace it.

4. When working alone, perform tasks that do not require a sterile hand first before gloving. For example, when preparing sets / instruments for a procedure, open the
5. Set and put in additional items or lotions first. Open the outer envelope of the gloves packet before washing the hand.
6. In most instances it is better for an assistant / partner to perform tasks that do not require a sterile hand.
7. When one hand is required to perform a task requiring contact with a non-sterile object or surface, consciously identify the contaminated hand and perform procedures with the other hand. These situations include:
  - When performing urinary catheterization hold the labia minora or prepuce of penis with the non-dominant hand (usually left).
  - Cleanse the urethra and insert the catheter with the dominant sterile hand (usually right).
  - When performing laryngeal suction (e.g. in a patient with a tracheostomy) hold the non-sterile sucker tubing with the left hand and the sterile suction catheter with the right hand.
  - When performing tracheo-bronchial suction on a ventilated patient, the aseptic technique is possible only if two care providers perform the task.
  - One person disconnects and reconnects the ventilator tubing to the endotracheal /tracheostomy tube. The other person performs the suction with a sterile catheter.

**4.1.4 Minimizing bacteria at entry points**

1. Depends on the site where the procedure is to be performed.
2. The patient's skin harbour commensals (e.g. Staphylococcus epidermidis), which are harmless on the skin surface but may induce disease in the blood circulation

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or through it to distant sites like heart valves, the urinary tract, the biliary tract, the lungs or the brain.

3. The patient's skin can never be made sterile, but the amount of bacteria can be reduced by applying on the skin antiseptics such as: Povidone iodine 10% weight per volume equivalent to 1% available iodine, 70% alcohol, Chlorhexidene 1:200 or mixtures of these.

#### **4.1.5 Creating a sterile field**

1. There should be a sterile area within which instruments used for the intended procedure can be placed without danger of it being contaminated by contact with non-sterile objects, such as the patient's body, the HCW body, non-sterile instruments, equipment, body fluids etc
2. A sterile field is created by covering the patient's body and work surfaces with drapes made of sterilized fabric or synthetic sheets. It is important for the sterile field to be wide enough to accommodate the instruments used and for the HCW to perform his/ her tasks.
3. The amount of skin exposed should be the minimum possible.
4. It must be realized that contamination of the sterile field will cause contamination of the instruments within it.
5. The care provider is allowed to be in contact with the sterile field if a sterile gown is worn. If only a glove is worn then the rest of the body should not come into contact with the sterile field.
6. The air is part of the sterile field. If procedures are performed in a properly designed procedure room or operation theatre, the content of micro-organisms in it is considered minimal and instruments are not rendered non-sterile on exposure to air. However exposure to air for a long duration (e.g. by leaving sets open for long periods) increases the risk of contamination by dust and other particles

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#### 4.1.6 Maintaining sterility of instruments/disposable items during a procedure

1. The non-touch technique is also used to ensure that instruments or items remain sterile during a procedure. The person opening packets/ envelopes must ensure that the inside of the packet is not touched.
2. He / she transfers it by letting it drop on to the sterile field. Another method is for the person receiving the item to grasp the item or the inside package from the packet with a gloved hand or sterile forceps without touching the exterior of the packet.
3. The entire sterile instruments / disposable items (such as lines and catheters) should lie within a sterile field. Special care must be taken when using long lines or wires e.g. guide wires.
4. Problems arise when the sterile catheter or tubes need to be connected to non-sterile connectors. Below are some of the situations when some of these problems occur and how they can be resolved:
  - When inserting a central line, introduce the IV catheter and all connecting tubes into the sterile field. After the catheter is inserted, pass the end of the intravenous tubing (used to puncture the IV solution bag) to the assistant.
  - The assistant connects the tubing to the bag and the fluid is run in to prime the line. The other end remains sterile in the sterile field and is then connected to the intravenous catheter.
  - The person performing the procedure should secure the connections before passing the containers (underwater seal bottles /urine containers/dialysate bags) to the assistant.

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## 4.2 Urinary Catheter Care

The urinary tract is one of the most common site of infection. Most urinary tract infection is following instrumentation of urinary tract, mainly urinary catheterization. One of the most important infection control measures is to limit the use of urinary catheterization to carefully selected patients. However, if there is a need to perform urinary catheterization, sterile procedure must be observed. Urinary catheters may be use as a short term measure or long term as in indwelling catheter. The following are general principle of urinary catheter insertion to reduce the infection of urinary tract.

### 4.2.1 General principles of urinary catheter insertion

#### 1. Personnel

Only personnel trained on the correct technique of insertion can perform aseptic catheter insertion. Hospital personnel and others who take care of catheters should be given periodic in-service training stressing the correct technique of insertion, care and potential complications of urinary catheterization.

#### 2. Catheter use

Urinary catheter should be inserted only when necessary and left in place only when as long as necessary. For selected patients other method of urinary drainage such as condom catheter drainage, suprapubic catheterization and intermittent urethral catheterization, can be useful alternatives to indwelling urethral catheterization.

#### 3. Hand hygiene

Hand hygiene should be practice before and after any manipulation of the catheter site or apparatus.

#### 4. Catheter insertion

Catheter should be inserted using aseptic technique and sterile equipments glove, drape, sponges, an appropriate antiseptic solution for peri-urethral cleaning, a single used packet of lubricant jelly should be use for insertion. Non-touch technique should be practice.

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Use as small a catheter as possible, consistent with good drainage should be use to minimized urethral trauma. Indwelling catheter should be properly secured after insertion to prevent movement and urethral traction. Use of silicone type catheter may be considered in long term indwelling catheter. After insertion the date of insertion should be documented.

#### **5. Close sterile drainage**

A sterile continuously closed drainage system should be maintained. The catheter and drainage tube should not be disconnected unless the catheter must be irrigated. If breaks occur in aseptic technique, disconnection, of leakage occur, the collecting system should be replaced using aseptic technique after disinfecting the catheter tubing junction.

#### **6. Irrigation**

Irrigation should be avoided unless obstruction is anticipated, as might occur with bleeding with prostatic or bladder surgery, closed continuous irrigation may be use to prevent obstruction. To relieve obstruction due to clots, mucous or other causes, an intermittent method of flushing may be use. Continuous irrigation of the bladder with antimicrobials has not proven to be useful and should not be perform as a routine infection prevention measures. The catheter tubing junction should be disinfected before disconnection.

A large volume and a sterile syringe and sterile irrigant should be used and then discarded. The person performing irrigation should use aseptic technique.

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

#### **7. Specimen collection**

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

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## 8. Urinary flow

Unobstructed flow should be maintained. Occasionally, it is necessary to temporarily obstruct the catheter for specimen collection or other medical purposes.

To achieve free flow of urine;

- The catheter and collecting tube should be kept from kinking.
- The collecting bag should be emptied regularly using a separate clean collecting container for each patient. (Change glove for each patient).
- Poorly functioning or obstructed catheters should be irrigated or if necessary, replaced.
- Collecting bag should always be kept below the level of the bladder. Always hang drainage bag at beside below groin level to allow gravity drainage and maintain unobstructed urine flow. Do not allow urine to flow from bag or tube back into bladder as the flow of urine may be contaminated and can cause urinary tract infection.

## 9. Meatal care

Catheter care should consist of good personal hygiene around the meatal area carried out a regular basis. Wiping after bowel cleaning should be carried out from front to back to avoid infection.

## 10. Catheter change interval

Do not change catheters at arbitrary fixed intervals. However to prevent encrustation, non silicone catheter may need to be change 2 or 3 weeks. Change only when necessary, such as when tube is obstructed, discolored etc. Catheter should be removed from post-operative patients as soon as possible. Indwelling catheterization is preferable to intermittent catheterization for some groups of post-operative patients in the reduction of complications.

## 11. Spatial separation of catheterized patients

Spatially separating infected and uninfected patients with indwelling catheters is not necessary.

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## 12. Bacteriologic monitoring

Regular bacteriologic monitoring of catheterized patients as an infection control measure is not recommended.

### 4.3 Wound Care

The need for dressing or wound care depends on the type of wound, which includes incision wound, abrasions, bedsores, ulcers, wound at site of drains and others.

The attending physician may require different wound technique for each type of wound. However, the choice of wound dressing should be large enough to cover and protect the wound site and tissue around it. It should allow circulation of air to the skin, secured to prevent slippage and is comfortable for the patient.

#### 4.3.1 General principles of wound care

##### 1. Hand hygiene

Proper hand hygiene before and after attending to a wound is mandatory. Sterile gloves should be worn after performing hand hygiene before starting the procedure.

##### 2. Technique

Practice a 'non-touch' technique. All instruments used during wound dressing must be sterile or autoclaved. Use sterile water as a cleaning liquid unless some other solution is recommended by doctor. Cover the entire wound and do not exposed the wound to prevent bacterial contamination. Use non adhesive gauze that promotes wound healing. Used gloves and soiled dressing must be properly disposed off into the clinical waste plastic bag.

##### 3. Environment

- Maintain a clean environment to minimize dust. High dusting or vacuum cleaning should finish an hour before dressing round begins. Infected wound must be detected early. To prevent spread, precautions such as cohorting the patient may be required. Wound care in the ward should begin with the uninfected wound first, then followed by the infected or dirty ones.

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## PREVENTION OF HEALTHCARE ASSOCIATED INFECTIONS

### 5.1 Urinary Tract Infection

#### 5.1.1 Introduction

Urinary tract infections (UTIs) are common type of HCAs. The usually benign nature of catheter-associated UTIs and the perception that they are easily treated by antibiotics may inhibit aggressive measures for both their prevention and their recognition

#### 5.1.2 Indications for Catheterization

Placement of an indwelling catheter should be performed only when indicated. It should be removed as soon as possible.

The accepted indications for catheterization are:

1. For short-term (days) management of incontinence (the inability to control urination) or retention (the inability to pass urine) not helped by other methods.
2. To measure urine output over several days in critically ill patients
3. To instill medications
4. For treatment of bladder outlet obstruction
5. For post-operative management of surgical patients with impaired bladder function

#### 5.1.3 Recommendations to Prevent Catheter-Related UTI

##### 1. Personnel

- Only persons who know the correct technique of aseptic insertion and maintenance of the catheter should handle catheters.

##### 2. Catheter Use

- Urinary catheters should be inserted only when necessary and left in place only for as long as it is required. They should not be used solely for the convenience of patient-care personnel.
- For selected patients, other methods of urinary drainage such as condom catheter drainage,

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suprapubic catheterization, & intermittent urethral catheterization may be more appropriate.

### 3. Hand hygiene

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

### 4. Catheter Insertion

- Catheters should be inserted using aseptic technique and sterile equipment.
- Gloves, drape, sponges, an appropriate antiseptic solution for peri-urethral cleaning, \ and a single-use packet of lubricant jelly should be used for insertion.
- As small a catheter as possible, consistent with good drainage, should be used to minimize urethral trauma.
- Indwelling catheters should be properly secured after insertion.

### 5. Closed Sterile Drainage

- The catheter collection system should remain closed and not be opened unless absolutely necessary for diagnostic or therapeutic reasons eg irrigation.
- If breaks in aseptic technique, disconnection, or leakage occur, the collecting system should be replaced using aseptic technique after disinfecting the catheter- tubing junction.

### 6. Irrigation

Continuous irrigation should be avoided unless indicated (e.g. after prostatic or bladder surgery).

- Continuous irrigation of the bladder with antimicrobials has not proven to be useful and should not be performed as a routine infection prevention measure.
- The catheter-tubing junction should be disinfected before disconnection.
- If the catheter becomes obstructed, the catheter should be changed.

### 7. Specimen Collection

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

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

### **8. Urinary Flow**

- Unobstructed flow should be maintained.
- Urine flow through the catheter should be checked several times a day to ensure that the catheter is not blocked.
- Collecting bags should always be kept below the level of the bladder.

### **9. Meatal Care**

Clean the urethral meatal area after each bowel movement or when soiled.

### **10. Catheter Change Interval**

Indwelling catheters should not be changed at arbitrary fixed intervals. To avoid encrustation, the maximum duration for silicone-coated latex catheter is 14 days.




### **11. Bacteriologic Monitoring**

The value of regular bacteriologic monitoring of catheterized patients as an infection control measure has not been established and is not recommended.

### **5.3 Nosocomial Respiratory Infection**

Pneumonia is one of the three most common HCAs. The risk factors for nosocomial pneumonia are extremes of age, severe underlying disease, immunosuppression, depressed sensorium, cardiopulmonary disease, and post thoraco-abdominal surgery. Patients who are mechanically ventilated are at risk for ventilator-associated pneumonia. 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.

#### **5.3.1 Prevention of Person-to-Person Transmission of Bacteria**

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1. Wear gloves when in contact with mucous membranes, handling respiratory secretions or objects contaminated with respiratory secretions. Hand hygiene should be performed after removal of gloves.
2. Change gloves and decontaminate hands between contacts with different patients
3. Change gloves between contacts with a contaminated body site and the respiratory tract or respiratory device on the same patient.
4. Wear a mask and an apron or gown when anticipate soiling of respiratory secretions from a patient (e.g. intubation, tracheal suctioning, tracheostomy, and bronchoscopy) and change it after procedure and before providing care to another patient.
5. Use a sterile, single-use catheter, if the open-method suction system is employed. Use only sterile fluid to remove secretions from suction catheter if the catheter is to be used for re-entry into the patient's lower respiratory tract.

**5.3.2. Precautions for prevention of aspiration**

- Remove devices such as endotracheal, tracheostomy, oro/ nasogastric tubes from patients as soon as they are not indicated.
- Perform orotracheal rather than nasotracheal intubation unless contraindicated.
- When feasible, use an endotracheal tube with subglottic suctioning to allow drainage of tracheal secretions that accumulate in the subglottic area.
- Ensure that secretions are cleared from above the endotracheal tube cuff before deflating the cuff in preparation for tube removal or before moving the tube.
- Elevate the head of the bed 30 - 45 degrees of a patient on mechanical ventilation or at high risk for aspiration (e.g. on oro or nasoenteral tube)
- Routinely verify appropriate placement of the feeding tube.
- Routinely assess the patient's feeding tolerance by measuring residual gastric volume and adjust the rate and volume of enteral feeding to avoid regurgitation.

**6. LABORATORY**

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### 6.10.1 General Principles

In this topic, references are made to the relative hazards of infective microorganisms by risk group (WHO Risk Groups 1, 2, 3 and 4). This risk group classification is to be used for laboratory work only. This risk group classification is to be used for laboratory work only. Table 1 describes the risk groups.

**Table 1. Classification of infective microorganisms by risk group**

Group	Risk	Type of infective organism
1	no or low individual and community risk	A microorganism that is unlikely to cause human or animal disease.
2	moderate individual risk, low community	A pathogen that can cause human or animal disease but is unlikely to be a serious hazard to risk laboratory workers, the community, livestock or the environment. Laboratory exposures may cause serious infection, but effective treatment and preventive measures are available and the risk of spread of infection is limited.
3	high individual risk, low community risk	A pathogen that usually causes serious human or animal disease but does not ordinarily spread from one infected individual to another. Effective treatment and preventive measures are available
4	high individual and community risk	A pathogen that usually causes serious human or animal disease and that can be readily transmitted from one individual to another, directly or indirectly. Effective treatment and preventive measures are not usually available.

- Laboratory facilities are designated as Biosafety Level 1 (basic), Biosafety Level 2 (basic), Biosafety Level 3 (containment), and Biosafety Level 4 (maximum containment).
- Biosafety level designations are based on a composite of the design features, construction, containment facilities, equipment, practices and operational procedures required for working with agents from the various risk groups.
- The assignment of an agent to a biosafety level for laboratory work must be based on a

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risk assessment. Such an assessment will take the risk group as well as other factors into consideration in establishing the appropriate biosafety level.

- Table 2 summarizes the facility requirements at the four biosafety levels.

**Table 2. Summary of biosafety level requirement**

	Biosafety Level			
	1	2	3	4
Isolation <sup>a</sup> of laboratory	No	No	Yes	Yes
Room sealable for decontamination	No	No	Yes	Yes
<b>Ventilation:</b>				
- Inward airflow	No	Desirable	Yes	
- controlled ventilation system	No	Desirable	Yes	
- HEPA-filtered air exhaust	No	No	Yes/No <sup>b</sup>	Yes
Double-door entry	No	No	Yes	Yes
Airlock	No	No	No	No
Airlock with shower	No	No	No	Yes
Anteroom	No	No	Yes	-
Anteroom with shower	No	No	Yes/No <sup>c</sup>	No
Effluent treatment	No	No	Yes/No <sup>c</sup>	Yes
<b>Autoclave:</b>				
- on site	No	Desirable	Yes	
- in laboratory room	No	No	Desirable	Yes
- double-ended	No	No	Desirable	Yes
Biological safety cabinet	No	Desirable	Yes	
Personnel safety monitoring capability	d	No	No	Desirable

a. Environmental and functional isolation from general traffic b Dependent on location of exhaust

b. Dependent on agent (s) used in the laboratory

c. For example. Window, closed-circuit television, two-way communication

Thus, the assignment of a biosafety level takes into consideration the organism (pathogenic agent) used, the facilities available, and the equipment practices and procedures required conducting work safely in the laboratory.

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### 6.10.2 Guidance and Recommendations

Diagnostic and health-care laboratories (public health, clinical or hospital-based) must all be designed for Biosafety Level 2 or above. As no laboratory has complete control over the specimen it receives, laboratory workers may be exposed to "high risk group" organisms. Therefore, standard precautions should always be adopted and practiced, as well as to promote good (i.e. safe) microbiological techniques (GMT).

### 6.10.3 Code of Practice

This code is a listing of the most essential laboratory practices and procedures that are basic to GMT. Each laboratory should adopt a safety or operation manual that identifies known and potential hazards, and specifies practices and procedures to eliminate or minimize such hazards. The most important concepts are listed below.

#### 6.10.3.1 Access

1. The international biohazard warning symbol and sign must be displayed on the doors of the rooms where microorganisms of Risk Group 2 or higher risk groups are handled. (Table 1)
2. Only authorized persons should be allowed to enter the laboratory working areas.
3. Laboratory doors should be kept closed.
4. Children should not be authorized or allowed to enter laboratory working areas.

#### 6.10.3.2 Personal protection

1. Laboratory coveralls, gowns or uniforms must be worn at all times. The coat/gown should be removed before leaving the laboratory and placed on the area provided.
2. Appropriate gloves must be worn for all procedures that may involve direct or accidental contact with blood, body fluids and other potentially infectious materials. After use, gloves should be removed aseptically and hands must then be washed.
3. Personnel must wash their hands after handling infectious materials and before leaving the laboratory working areas.
4. Protective devices must be worn whenever necessary to protect the eyes and face from splashes, impacting objects and sources of artificial ultraviolet radiation.
5. Any cuts, abrasions or other skin lesions must be properly covered to protect them against contamination before starting work.
6. Eating, drinking, smoking, applying cosmetics and handling contact lenses is prohibited in the laboratory working areas.
7. Storing human foods or drinks anywhere in the laboratory working areas is prohibited.

#### 6.10.3.3 Procedures

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1. Materials must not be placed in the mouth.
2. Any technical procedures should be performed in a way that minimizes the formation of aerosols and droplets.
3. The use of hypodermic needles and syringes should be limited. They must not be used as substitutes for pipetting devices
4. All spills, accidents and overt or potential exposures to infectious materials must be reported to the laboratory supervisor. A written record of such accidents and incidents should be maintained.
5. A written procedure for the clean-up of all spills must be developed and followed.
6. Contaminated liquids must be decontaminated (chemically or physically) before discharge to the sanitary sewer. An effluent treatment system may be required, depending on the risk assessment for the agent(s) being handled.
7. Written documents that are expected to be removed from the laboratory need to be protected from contamination while in the laboratory.

**6.10.3.4 Laboratory working areas**

1. The laboratory should be kept neat, clean and free of materials that are not pertinent to the work.
2. Work surfaces must be decontaminated after any spill of potentially dangerous material. At the end of the working day all working surfaces must be decontaminated.
3. All contaminated materials, specimens and cultures must be decontaminated before disposal. Decontamination shall be done for any reusable materials
4. Packing and transportation must follow applicable national and/or international regulations.

**6.10.3.5 Biosafety management**

1. It is the responsibility of the laboratory director (the person who has immediate responsibility for the laboratory) to ensure the development and adaption of a biosafety management plan and a safety or operations manual.
2. The laboratory supervisor (reporting to the laboratory director) should ensure that regular training in the laboratory safety is provided.
3. Personnel should be advised of special hazards, and required to read the safety or operation manual and follow standard practices and procedures. The laboratory supervisor should make sure that all personnel understand these. A copy of the safety or operations manual should be available in the laboratory.
4. There should be an arthropod and rodent control programme.
5. Appropriate medical evaluations, surveillance and treatment should be provided for all

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personnel in the case of need, and adequate medical records should be maintained.

#### **6.10.4 Laboratory Design And Facilities**

Special attention should be paid to the conditions that are known to pose safety problems. These include:

1. Formation of aerosols
2. Work with large volumes and/or high concentrations of microorganism
3. Overcrowding and too many equipments
4. Infestation with rodents and arthropods
5. Unauthorized entrance
6. Workflow: use of specific samples and reagents

##### **6.10.4.1 Design features**

1. Ample space must be provided for the safe conduct of the laboratory work and for cleaning and maintenance.
2. Walls, ceilings and floors should be smooth, easy to clean, impermeable to liquids and resistant to the chemicals and disinfectants normally used in the laboratory. Floors should be slip-resistant.
3. Bench tops should be impervious to water and resistant to disinfectants, acids, alkalis, organic solvents and moderate heat.
4. Illuminations should be adequate for all activities. Undesirable reflections and glare should be avoided.
5. Laboratory furniture should be sturdy. Open spaces between and under benches, cabinets and equipment should be accessible for cleaning.
6. Storage space must be adequate to hold supplies for immediate use and thus prevent clutter in bench tops and in aisles. Additional long-term storage space, conveniently located outside the laboratory working areas, should also be provided.
7. Space and facilities should be provided for the safe handling and storage of solvents, radioactive materials, and compressed and liquefied gases.
8. Facilities for storing outer garments and personal items should be provided outside the laboratory working areas.
9. Facilities for eating and drinking and for rest should be provided outside the laboratory working areas.
10. Hand-washing facilities, with running water if possible, should be provided in each laboratory room, preferably near the exit door.
11. Doors should have vision panels, appropriate fire rating, and preferably be self-closing.

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12. At Biosafety Level 2, an autoclave or other means of decontamination should be available in appropriate proximity to the laboratory.
13. Safety systems should cover fire, electrical emergencies, and emergency shower and eyewash facilities.
14. First-aid areas or rooms suitable equipped and readily accessible should be available.
15. In the planning of new facilities, consideration should be given to the provision of mechanical ventilation systems that provide an inward flow of air without recirculation. If there is no mechanical ventilation, windows should be able to be opened.
16. Considerations should be given to the installation of a separate air conditioning system to control the heat gain from equipment with high heat outputs, e.g. fridges and incubators. It is preferable to use a sealed type of unit that re-circulates cooled air into the room.
17. A dependable supply of good quality water is essential. There should be no cross-connections between sources of laboratory and drinking water supplies. An anti-backflow device should be fitted to protect the public water system.
18. There should be reliable and adequate electricity supply and emergency lighting to permit safe exit. A stand-by generator is desirable for the support of essential equipment such as incubators, biological safety cabinets, freezer, etc.,
19. There should be a reliable and adequate supply of gas. Good maintenance of the installation is mandatory.

#### **6.10.5. Laboratory Equipment**

Technically with good procedures and practices, the use of safety equipment will help to reduce risks when dealing with biosafety hazards. The laboratory director should ensure that adequate equipment is provided and that it is used properly. Equipment should be selected to take account of certain general principles, i.e. it should be:

1. Design to prevent or limit contact between the operator and the infectious material.
2. Constructed of materials that are impermeable to liquids, resistant to corrosion and meet structural requirements.
3. Fabricated to be free of burrs, sharp edges and unguarded moving parts.
4. Designed, constructed and installed to facilitate simple operation and provide for ease of maintenance, cleaning, decontamination and certification testing; glassware and other breakable materials should be avoided, whenever possible.

#### **6.10.5.1 Essential biosafety equipment**

1. Biological safety cabinets Class II, to be used whenever:

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- All infectious materials are handled; such materials may be centrifuged in the open laboratory if sealed centrifuge safety cups are used and if they are loaded and unloaded in a biological safety cabinet.
  - There is an increased risk of airborne infection.
  - Procedure with a high potential for producing aerosols are used; these may include centrifugation, grinding, blending, vigorous shaking or mixing, sonic disruption and opening of containers of infectious materials
2. Electric transfer loop incinerators may be used inside the biological safety cabinet to reduce aerosol production.
  3. Screw-capped tubes and bottles.
  4. Autoclaves or other appropriate means to decontaminate infectious materials.
  5. Petri dishes must be placed in racks or baskets, both for transport and storage.
  6. Plastics disposable Pasteur pipettes, whenever available, to avoid glass
  7. Equipment such as autoclaves and biological safety cabinets must be validated with appropriate methods before being taken into use. Recertification should take place at regular intervals, according to the manufacturer's instructions.

#### **6.10.6 Health and Medical Surveillance**

The employing authority, through the laboratory director, is responsible for ensuring that there is adequate surveillance of the health of laboratory personnel. The objective of such surveillance is to monitor for occupationally acquired diseases. Appropriate activities to achieve these objectives are:

1. Provision of active or passive immunization where indicated
2. Facilitation of the early detection of laboratory-acquired infections.
3. Exclusion of highly susceptible individuals (e.g. pregnant woman or immunocompromised individuals) from highly hazardous laboratory work.
4. Provision of effective personal protective equipment and procedures.

#### **Guidelines for the surveillance of laboratory workers handling microorganism at Biosafety Level 2**

1. A pre-employment or pre-placement health check is necessary. The person's medical history should be recorded and a targeted occupational health assessment performed.
2. Records of illness and absence should be kept by the laboratory management

#### **6.10.7 Waste Disposal and Decontamination**

Identification and separation system for infectious materials and their containers should be

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adopted.

Categories should include:

1. Non-contaminated (non infectious) wastes can be reused or recycled or disposed of as general, "household".
2. Contaminated (infectious) "sharps" - hypodermic needles, scalpels, knives and broken glass. These should always be collected in puncture-proof containers fitted with covers and treated as infectious.
3. Contaminated material for decontamination by autoclaving and thereafter washing and reuse or recycling.
4. Contaminated material for autoclaving and disposal.
5. Contaminated material for direct incineration.

#### **6.10.8 Chemical, Fire, Electrical, Radiation and Equipment Safety**

A breakdown in the containment of pathogenic organisms may be indirect result of chemical, fire, electrical or radiation accidents. It is therefore essential to maintain high standards of safety in these fields in any microbiological laboratory.

#### **6.10.9 Transport of Infectious Substances**

Transport of infectious and potentially infectious materials is subject to strict national and international regulations. These regulations describe the proper use of packaging materials, as well as other shipping requirements.

Laboratory personnel must ship infectious substances according to applicable transport regulations. Compliance with the rules will:

1. Reduce the likelihood that packages will be damaged and leak, and thereby
2. Reduce the exposures resulting in possible infections
3. Improve the efficiency of package delivery.

The basic triple packaging system

1. This packaging system consists of three layers: the primary receptacle, the secondary packaging and the outer packaging.
2. The primary receptacle containing the specimen must be watertight, leak proof and appropriately labeled as to content. The primary receptacle is wrapped in enough absorbent materials to absorb all fluid in case of breakage or leakage.
3. A second water tight, leak proof packaging is used to enclose and protect the primary receptacle (s). Several wrapped primary receptacles may be placed in a single secondary packaging. Volume and/or weight limits for packaged infectious substances are included in certain regulatory texts.

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4. The third layer protects the secondary packaging from physical damage while in transit. Specimen data forms, letters and other types of information that identify or describe the specimen and identify the shipper and receiver, and any other documentation required must also be provided. Add diagram

#### 6.10.10 Training Programme

A continuous, safety training programme is essential to maintain safety awareness among laboratory and support staff. Laboratory supervisors, with the assistance of the biosafety officer and other resource persons, play the key role in staff training. The effectiveness of all safety and health training, depends on management commitment, motivational factors, adequate initial job training, good communications, and ultimately the organization's goals and objectives.

## 7. POLICY ON WASTE DISPOSAL

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### What is Biomedical waste?

Biohazardous waste refers to all waste, which is generated during diagnosis treatment or immunization of human beings.

### Purpose

The purpose is to provide safe guidelines to ensure the correct handling of the waste and maximum prevention of contamination through across the hospital.

Components of biomedical waste management:

- a. Segregation of waste at source
- b. Collection and transportation of waste.
- c. Storage of waste
- d. Transportation of waste to the common facility.
- e. Treatment and disposal of waste.

### Principles

The recommendations given are intended to protect the interests of patients, staff and the general public emphasizing the need to:

- o Train staff in safe practice
- o Separate waste at source
- o Provide safe storage awaiting collection

Provide collection and transportation to central disposal points

### Types of waste

- o Domestic waste including glass, aerosols and batteries
- o Infected waste including soiled dressings, body fluids, amputated limbs
- o Needles, syringes and all sharps
- o Radiological and cytotoxic waste
- o Pathology waste (including tissue)

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- o Clinical waste (gloves, syringes, suction tubes)
- o Confidential paper waste and the handling of used CSSD items linen (See Policy for Laundry Disposal) and non-clinical waste including office paper, plastic not been in contact with patients and kitchen waste

### **SEGREGATION OF WASTE**

Waste from different clinical areas of different nature may require different methods of disposal. It is essential that all staff is aware of safe methods of disposal. This is to protect the staff from injury and also safeguard the community at large. Biomedical waste should not be mixed with other waste. Segregation at source is done by Doctors, nurses and paramedical staff. They are segregated into different containers, which are labeled with the biohazard symbol indicating the nature of waste. These containers contain self-printed dustbin covers to enable the staff to segregate the waste without any confusion. Bins should be easy to use. Pedal bins are used in order to prevent cross infection.

### **STAFF TRAINING**

All staff who may be required to move waste should comply with the following guidelines:

- o Check that all bags are effectively sealed. Clinical waste bags must have tag or rubber bands and indicate the area / ward of origin with the marker pen.
- o Bags to be emptied when 2 / 3 full. To be handled by neck. To be handled only after securing. Should be double bagged if external contamination occurs.
- o Under no circumstance should any member of staff put their hands into the bags
- o Ensure that the bag is intact and that the seal on the bag is unbroken prior to moving.
- o Know the procedure in case of accidental spillage

### **TRANSPORTATION AND COLLECTION**

Collection and transportation of biomedical waste shall be carried out in a matter so as to avoid any possible hazards to human health and environment. Therefore all care should be taken to ensure that the segregated waste reach the common biomedical treatment facility without any damage, spillage or unauthorized access by public. A separate team of housekeeping staff is identified for collecting the segregated waste at all points in closed trolleys to the common storage area identified at the rear end of the hospital. When the covers are three fourth filled they

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are tagged appropriately. The person responsible for collection of the biomedical waste carries a checklist to maintain the records such as name of the user department, type of waste and signature of the user department. Permanent marker pens are used to mark on the dustbin cover denoting the area from where it is generated so that the user end can be traced back if the waste is not segregated properly.

<b>Area</b>	<b>Frequency</b>
Operation theatre	after each surgery
Critical areas	once in 6 hrs
Wards	once in 6 hrs
Labs	once in 6 hour
Treatment rooms	once in every hour
Offices	Twice a day

**Storage of waste**

The collected segregated waste is stored in designated compartments containing big puncture proof drums. All the waste as per the category are weighted and entered in the checklist. The drums should be strong enough to withstand any possible damage that may occur during loading, transportation and unloading of such containers. No untreated biomedical waste is kept beyond 24 hours in our premises. All the compartments are tiled to enable proper washing after every shift.

**Transportation, treatment and disposal of waste at the common facility**

The transportation treatment and disposal of waste is carried out by the contractor identified by the Tamilnadu Pollution control board. All the hospitals have made agreement with the Common Biomedical Waste Treatment Facilities (CBMWTF) for the disposal of the biomedical waste. The institution had signed a MOU with Biomedical Waste treatment called BIOHAZARD, located Ettankulam - Tirunelveli District. They come everyday to collect the waste. The facilities available in this place are

1. Incinerator, with full scrubbing system.
2. A fully automized autoclave
3. Conveyor from autoclave to shredding
4. Blood bag shredder.
5. Land fill area and cement pits.
6. A fleet of 2 specially built trucks to carry waste from hospital. (leak proof to avoid leaks during transportation)
7. Modular effluent treatment plan for treating water.

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### Incinerator

It is a controlled combustion process where waste is completely oxidized and harmful microorganisms present in it are destroyed at high temperature.

The temperature of the primary chamber shall be  $900^{\circ}\text{C} \pm 50^{\circ}\text{C}$ . The secondary chamber temperature shall be  $1050^{\circ}\text{C} \pm 50^{\circ}\text{C}$ . (200 kgs per hour can be incinerated.)

### Autoclave

It is a low heat thermal process where steam is brought into direct contact with waste in a controlled manner and for sufficient duration to disinfect the waste. A standard accepted method using steam generated at high pressure (35psi) and temperature ( $121^{\circ}\text{C}$ ). The autoclave disinfects treats and mutilates the material. The rule clearly specifies that the autoclave should be dedicated for the purpose of disinfection and treatment of biomedical waste.

### Shredder

Shredder is a process by which the waste are reshaped or cut into smaller pieces so as to make the wastes unrecognizable. It helps in prevention of reuse of biomedical waste and also acts as identifiers that the wastes have been disinfected and are safe to dispose off.

### Deep burial

A pit or trench dug about 2 mtrs deep. It should be half filled with waste then covered in lime within 50cms of surface before filling the rest of the pit with soil. Covers of galvanized iron / wire mesh are used.

### Cement pits

Cement pits are constructed for storing treated sharps.

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Different Categories of Waste

Type Of Waste	Particulars	Colour Code	Treatment and disposal
Infectious Waste	Human Anatomical waste: (Human tissues, organs, body parts) Microbiology & Biotechnology waste (Wastes from laboratory cultures, dishes and devices used for transfer of cultures) Items contaminated with blood, and body fluids including cotton, dressings, soiled plaster casts, disposable linen, tissue paper, other materials contaminated with blood.	Yellow	Incineration, ashes for deep burial.
Clinical waste (Plastic waste)	All types of I.V. and other tubing's catheters, disposal syringes, blood bags, urine bags, gloves, dialysis kits, all kinds of drains and aprons.	Red	Autoclaved, shredded and disposed In secured landfill
Sharps	All kinds of broken glasses, blades and ampules, sharps like scalpels, needles, clinical and pathological slides	Puncture proof container	When the container is 3/4 <sup>th</sup> filled it is closed and handed over to the contractor Sharp container contains all kinds of broken glasses, blades, ampules, scalpels, clinical and pathological slides . When the container is 3/4 <sup>th</sup> filled it is closed and handed over to the contractor. Chemical disinfection, Autoclaved and stored in cement pits .

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Discarded medicines.	Wastes comprising of outdated , contaminated and discarded medicines.	black	Incineration, ashes for deep burial.
Bottles	Broken and unbroken bottles	White	Chemical disinfection Autoclaved and stored in cement pits.
Food and Stationary waste	Paper , food waste	green	Handed over to the contractor.

**DO'S**

1. Put on appropriate mask, cap and apron, gumboots and needle proof gloves.
2. Clean all surface of dustbin with disinfectant solution. Filled sharp containers are replaced with empty sharp containers at various locations. Needle cutter boxes are removed when they are three forth filled and replaced with empty ones.
3. Checklist maintained by the housekeeping staff is checked by the supervisor.
4. Appropriate colour coded dustbins.
5. The clearance is done thrice a day.

**DON'T:**

1. Do not compact the waste with your hands.
2. Always wear safety gears like gloves, mask, apron and cap before handling waste.
3. Through cleaning of the compartments is done with hosepipe.

**MERCURY SPILL**

- Due to the hazardous nature of these agents, personnel cleaning up Mercury spills should use full protective equipment and clothing, such as gowns, double gloves and respiratory protection.
- All contaminated materials must be discarded into designated cytotoxic waste containers.

**Mercury spill management kit consists of:**

- PPE (gloves, mask and cap)

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- Cone shaped x-ray sheet
- A piece of x-ray film
- Disposable syringe 10 cc
- Torch
- Transparent Covers -2
- Mercury collecting container with water
- Transpore

**Management**

- Provide proper ventilation if it is a closed room & Isolate the area(place caution boards)
- Wear PPE
- Collect the large spills by using syringe (Aspirate the spill)
- Switch off the light and fan
- Identify the small spills by using a lightened torch
- With the help of the x-ray sheet join the small spills and collect it by using the cone shaped x-ray film
- The minute spills can be collected by transpore
- Keep the collected spill in the mercury container with water and seal it well to prevent further spillage.
- Place all the articles used for spill management in one transparent cover and label it as mercury spill [The cover should be sealed well)
- Place the labeled transparent cover and sealed mercury spill container on other transparent bag which should be sealed properly
- The container wrapped well and labeled as mercury spill
- Send the spill to biomedical department
- Replenish all the items and keep the kit ready for next use

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## 8. HOSPITAL OUTBREAK MANAGEMENT

### 8.1 Introduction

All health care facilities especially major hospitals would have ongoing surveillance activities for healthcare associated infection (HCAI). The usual level of occurrence or incidence of an infection within the facility is usually known and this would be considered as the mean control limit. However, an upper control limit of the occurrence of the infection should be identified in order to serve as an alert line for the Infection Control Team (ICT) to investigate for a probable outbreak.

### DEFINITION OF HEALTHCARE ASSOCIATED INFECTION OUTBREAK (EITHER ONE)

1. Two or more associated cases occurs at the same time within same locality/ department
2. Greater than expected rate of infection compared with the usual background case for the place and time
3. In certain newly emerging disease e.g. Legionnaires infection or anthrax, will only require 1 single case.

In HCAI outbreak, clinical findings of reported cases should be reviewed closely. It is important to directly examine the patients, reviewing of the medical records and have a discussion with the doctor in-charge. A discrepancy between the clinical and laboratory findings may occur if an outbreak is factitious, for example due to laboratory error. An outbreak maybe judged minor or major after consideration of its complexity, number of person affected, pathogenicity of the organism involved, potential transmission and any unusual features.

### 8.2 Steps in Outbreak Investigation and Management

No.	Procedures	Responsibilities
1.	A probable diagnosis of an outbreak arises from laboratory based surveillance or clinical report from a unit/department	ICN
2.	Investigate and gather information on the probable outbreak, both from microbiological data, environmental investigation and patient's placement and movement. Carry out mapping of cases.	ICN

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3.	Suspect a true outbreak if cases appear to be linked in time, space or persons. Produce a preliminary report and hold the discussion.	ICCT
4.	Alert all parties involved of probable outbreak and carry out further investigations such as screening of involved patients, contacts and environment microbiological samples to identify source, reservoir and mode of transmission.	ICN
5.	Produce report on the outcome of the investigations (possible primary source, microorganism, magnitude of an outbreak) and recommendation immediate actions to contain the outbreak and prevent further transmission.	ICCT
6.	Discussion at the ICCT level only if it is a minor outbreak. HIACC chairman will then inform M.S if it is a major outbreak. M.S Declare outbreak. Recommend closure of unit/ward if indicated.	ICCT/HIACC/
7.	Check if infection control policies and procedures are breached.	ICN
8.	Administer outbreak control measures according to the known modes of transmission (airborne, droplet or contact) of the organisms and appropriate source control. (Contaminated TPN, chlorhexidine).	ICCT
9.	Re-evaluate the outbreak situation and effectiveness of interventions. Take remedial action if the outbreak is still not contained.	ICCT
10.	Announce end of outbreak when no more new cases or the number of cases has reduced to usual mean control limit. (arbitrarily within 1 month)	HIACC
11.	A final report is produced at the end of the outbreak. Recommend on change of infection control policies or procedures if indicated	ICCT/HIACC
12.	Disseminate report to all relevant departments.	ICCT

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## 9. OCCUPATIONAL HEALTH AND SAFETY

### To facilitate disease detection and treatment

- Follow up on exposure to communicable diseases
- Maintain a system for health assessment
- Promote a safe environment
- Promote health care worker education

### Examples of occupational illnesses and injuries for which treatment of employees may be needed

- Needle stick injury
- Exposure to communicable diseases
- Active infection acquired in the hospital setting

### Employees Health Check up

- Pre placement health checkup will consist of
- Laboratory Studies [anti HBs titer, HIV, HbsAg, HCV serology
- Detailed history regarding immunization status and past medical history will be kept in personal employee file
- Those who are not vaccinated will be given Hep B vaccine before joining.
- Those who have taken vaccine will have to check Anti Hbs titer.

The pre-employment screening details will be maintained by the personal department as part of employee's personal file.

### Prophylactic therapy

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- It is recommended that all healthcare workers be vaccinated against Hepatitis B as a part of their initial health screening. All staff likely to come into blood and body fluids is also vaccination.
- Typhoid Vaccine should be given once in 3 years for canteen staff

**Employee Health Check**

1. Lab staff should be examined every 6 months by staff physician. If needed Blood R/E , Chest X-ray, Mantoux test can be done.
2. Hazardous material users should be examined every 6 months by staff physician.
3. Canteen staff should be examined every 6 months by staff physician.

In addition Stool R/E ,Blood R/E and stool etc to be send to Lab.

4. Rest of the staff should be examined yearly once by staff physician . This include House keeping, Nursing staff once a year ,if needed Blood R/E , Chest X-ray, Mantoux test can be done.

**10. ENVIRONMENT**

**Department of housekeeping:**

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Disinfectants in all health care areas are the responsibility of the House keeping department

Hand wash liquid is provided in all Nurse station, Public toilets Etc.

Hand rub is provided in all patient care areas.

**CLEANING MATERIALS DILUTION**

SL.No	Name of Chemical	Purpose	Form	Dilution
1.	VIREX-TASKI	Disinfectant	Liquid	4ML= 1Ltr water
2.	R1- TASKI	Cleaning solution Wash room floor/wall	Liquid	25-30ML=1Ltr water
3.	R2- TASKI	Cleaning solution Floor/wall	Liquid	25-30ML=1Ltr water
4.	R6-TASKI	Closet cleaner	Liquid	Ready to use
5.	Fumispray/Aerosept	Disinfectant	Liquid	Ready to use
6.	Sodium hypochlorite	Disinfectant	Liquid	10ml=1Ltr Water

**10.1. ENVIRONMENTAL SURVEILLANCE**

**Sampling**

Routine microbiologic sampling of the air and environmental surface should not be done since rates of nosocomial infections are not related to levels of general contamination of air or environmental surfaces, and meaningful standards for permissible levels of microbial contamination of environmental surfaces does not exist. Microbial sampling when indicated should be an integral part of epidemiological investigation.

**Method:**

1. Swab cultures
2. Settle plate (two blood agar plates, exposed to air, for a ½ an hour- 1 hour period in each of the monitored areas).

**AIR SAMPLING RESULTS OF ENVIRONMENTAL STUDY BY SETTLE PLATE**

**METHOD**

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	<b>OT's</b>
Satisfactory	<30 (+5)
Acceptable limits	30-50 (+5)

### **ACTION REQUIRED ON THE RESULTS**

If surveillance findings are satisfactory, a report stating that the environment is adequately sterile is issued. The existing practices are allowed to continue. If findings are unsatisfactory or merely within acceptable limits, based on aerogenic microbial load estimation, a recommendation, regarding extra disinfection with Virkon and / or bacillocid as well as a word of caution about avoidance of unnecessary traffic of people is made. A monitoring of the air conditioning is also sometimes indicated.

### **MONITORING OF DISINFECTANTS**

- Monitoring of Glutaraldehyde
- This shall be carried out by the technical team/ nursing in the area concerned, by strip method as per manufacturer's instructions, before each use.
- The results would be documented as pass or fail. If the Glutaraldehyde check is unsatisfactory or failed, Glutaraldehyde would be discarded and fresh glutaraldehyde would then be used for disinfection after retesting.

### **IN-USE TEST OF KELSEY AND MAURER (1966)**

The in-use tests shall be randomly performed to check the end results of disinfection. Samples shall consist of in-use dilutions of chemical disinfectants such as glutaraldehyde, OPA, Hypochlorite Etc.

### **PROCEDURE**

1. Collect used disinfectant using all aseptic precautions.

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2. Transfer one ml of the disinfectant fluid into tube containing 9ml of the diluent.
3. The diluents used for different groups of disinfectant are listed below.
  - a. Nutrient broth for alcohols, aldehydes, hypochlorites and phenolics.
  - b. Nutrient broth containing Tween – 80 (3%), for diguanides, Hypochlorite detergent mixtures, iodophores, phenolic detergent mixtures and quaternary ammonium compounds
4. Withdraw a small aliquot with 50 drops per ml. Pipette (20ul/drop)
5. Place 10 drops separately on the surface of nutrient agar in duplicate.
6. Incubate both the plates for 72 hours – one at room temperature and the other at 37°C
7. Growth from more than five of the ten drops in either of the plate indicates a failure of disinfection.

#### **TESTING OF DISINFECTANTS BY THE BROTH DILUTION METHOD**

To 1ml of the working concentration of each disinfectant, 1 drop of a standardized broth suspension of each test organism is added and allowed to remain in contact for varying lengths of time, depending on the manufacturers recommendations, and the purported use of the disinfectant. After each required period of contact, a drop of the mixture of disinfectant and culture is added to 2ml of nutrient broth with or without between 80. from each 2ml nutrient broth, subcultures are made on to B.A and SDA. The absence of growth after 48-72 hrs of incubation is taken as indicative of good antimicrobial activity.

#### **SURVEILLANCE OF HOSPITAL WATER**

Periodicity: once in a month

Method: estimation of the MPN (most probable number) of coliform bacilli using McCready's table.

#### **DRINKING WATER**

Periodicity: once in a month

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Method: Colony count

#### 10.4 POLICY ON FOOD HYGIENE IN CLINICAL AREAS

In hospitals, where patients may have a lowered resistance to infection, it is important that food hygiene standards and temperature control are maintained

All staff must ensure that their own personal standard of hygiene is of optimum standard at all times. Staff must also ensure that any defects in kitchen construction or equipment are reported to the appropriate manager

**Premises:** All food is prepared in the main kitchen and sent to the wards. The premises in which the food is handled must be clean and in good condition. The walls, floor, ceilings, windows, woodwork and all surfaces must be in good repair so that they can be easily cleaned. Pest control should be undertaken three times every year. Thorough cleaning should be carried out annually.

**Articles and Equipment:** All articles and equipment, which come into contact with food, must be kept clean and must be non-absorbent. Articles and equipment must not contaminate food in any way. Wash hand basins must be used **only** for washing hands and arms and not for food preparation.

**Sanitary conveniences:** Adequate toilet facilities are provided for staffs. These must be kept clean and staff should be reminded by a notice fixed in the sanitary convenience to wash their hands after using the toilet.

**Refuse:** Refuse and waste food must be properly stored away from the food preparation area. Refuse containers should be emptied regularly. Food returned to the kitchen should be discarded to prevent bacterial growth.

**Lighting and Ventilation:** All parts of the premises must have sufficient lighting and ventilation. This is necessary to ensure safe and comfortable working conditions. High temperature in a kitchen can promote the growth of bacteria. A mechanical ventilation system is the best way to ensure stale air and fumes are removed efficiently.

**Outdoor Clothes:** All food premises where open food is handled must have space for staff to store their outdoor clothing and footwear. If clothing is stored in food rooms, then it must be stored in lockers.

#### Role of Food Service personnel

1. Defining the criteria for the purchase of foodstuffs, equipments use, and cleaning procedures to maintain a high level of food safety
2. Ensuring that the equipment used and all working and storage areas are kept clean
3. Ensuring appropriate handling and disposal of wastes

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4. Establishing programmes for training staff in food preparation, cleanliness, and food safety

**Requirements related to food handlers and the handling of food**

**Dietary personnel**

At the time of employment all personnel complete a health questionnaire. They have a personal interview and a physical examination is also conducted. They have a medical check-up every six months.

- a. Stool for Amoebiasis / worms / cysts – every six months
- b. Typhoid vaccine – once in three years
- c. Eye check-up for cooks – Once in a year

If a food handler is suffering with food poisoning or any staphylococcal infection likely to cause food poisoning, he / she must immediately notify their Manager. The food handler will be required to refrain from handling food until he / she is non-infectious.

Food handlers wear caps and gloves while setting trays. They are educated to observe Universal Precautions. They observe strict personal hygiene.

**Procurement of Raw Material**

1. Only properly labeled raw material is received from reputed suppliers with whom a rate contract is made each year.
2. All the material is physically inspected by the Chef-on-duty for quality & substandard material if any is rejected at the time of delivery.
3. Fresh supplies, which include fruits, vegetables, milk & milk products, fish and meats are procured on a daily basis.
4. Provisions & other dry commodities are also indented from the main stores on a daily basis.

**Risk of contamination / wrapping of food**

1. Food must be protected from cross-contamination. Cooked and uncooked foods are kept separate.
2. Any wrappings used for food are clean and not be likely to contaminate the food.

**Storage**

This regulation applies to certain "high risk" foods such as foods containing meat, fish, egg or milk products. It is important to ensure that such foods are stored below 4°C or above 63°C,

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until they are ready for the patient. Both hot and cold food items are transported appropriately so that food temperatures are maintained during transportation

1. Meats & other frozen items are stored at sub zero temperature in deep freezers (-18°C).
2. All fresh supplies are stored in walk-in & other refrigerators at 10 to 15 °C.
3. Provisions & other dry material are stored on shelves 6" above the floor at room temperature, which is usually about 25° C.
4. First in first out principle is followed for provisions and other dry material.

**Food preparation**

1. Pre-preparation and preparation of food is carried out in hygienic conditions.
2. Each meal is freshly prepared and consumed during the mealtime.
3. Leftover if any, is discarded immediately.

**Crockery and cutlery**

- All crockery and cutlery is passed through a dishwasher with steam after use.
- Food Delivery

**Factors contributing to food poisoning**

1. Preparing food more than a half day in advance of needs
2. Storage at room temperature
3. Inadequate cooling
4. Inadequate reheating
5. Use of contaminated processed food (cooked meats and poultry, pies and take-away meals) prepared in premises other than those in which the food was consumed
6. Undercooking
7. Cross-contamination from raw to cooked food
8. Contamination from food handlers.

**Factors important for quality control**

1. Purchased food must be of good quality and bacteriologically safe
2. Storage facilities must be adequate, and correspond to requirements for the food type
3. The quantity of perishable goods should not exceed an amount corresponding to one day's consumption
4. Dry goods, preserves, and canned food should be stored in dry, well-ventilated storerooms, and stocks rotated.
5. Frozen food storage and preparation must follow producers instructions, and be kept at temperatures of at least – 18°C (-0.40F); do not freeze

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6. The catering system environment must be washed often and regularly with tap water and appropriately detergents.
7. Samples of prepared food should be stored for a specified time period, to allow retrieval for testing should an outbreak occur.
8. Food handlers should receive continuing instruction in safe practices.

**Prevention of food poisoning**

1. Maintain a clean work area
2. Separate raw and cooked food to avoid cross contamination
3. Use appropriate cooking techniques and follow recommendations to prevent growth of microorganisms in food
4. Maintain scrupulous personal hygiene among food handlers, especially hand washing, as hands are the main routes of contamination.
5. Staff should change work clothes at least once a day, and keep hair covered.
6. Avoid handling food in the presence of an infectious disease (cold, influenza, diarrhoea, vomiting, throat and skin infections), and report all infections.

personal protective equipment as indicated.

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### 10.1 Infection Control during construction and renovation

Construction and renovation activities in the hospital may be associated with transmission of pathogens such as filamentous fungi, including *Aspergillus* spp, *Candida* spp, *Fusarium* and also bacteria such as *Legionella* and *Nocardia*. The most commonly reported hospital construction-related infection is *Aspergillus*, which represent the greatest threat to neutropenic patients.

Construction and renovation activities in the hospital facility are associated with variable levels of risks to the patients and it is important to understand what these risks are. Activities that are associated with significant generation of dusts create appreciable risks to mainly immune compromised patients such as oncology, bone marrow transplant, burns and intensive care units such as NICU and ICU. Examples of these construction activities include new construction projects and major demolition of buildings. These activities create a lot of dust which may carry *Aspergillus* spores. Moderate levels of dust may be associated with activities such as sanding of walls prior to painting, construction of new walls and major cabling activities. Inspection and noninvasive activities such as removal of ceiling board for visual inspection, painting and minor plumbing works are low risk activities that generally cause minor generation of dusts.

Patients who are at risk should be identified prior to the construction and renovation activities. Immunocompromised and ventilated patients are at high risks of construction-associated aspergillosis. These include cancer patients, transplant patients, neonatal intensive and adult intensive care patients and patients in the operating theater. Medium risk patients include endoscopy, cardiology, radiology and physiotherapy units. Office areas pose low risks to patients.

Pre-construction and renovation consultation should be carried out in advance between all the stakeholders, including hospital management, infection control unit, microbiology unit, security unit, project architects and engineers and the contractor. This will help to identify the

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scope and nature of work and also to assess the degree of risks and potential patient groups that may be affected. Close monitoring of filamentous fungi isolation rates, especially aspergillus by the microbiology laboratory and prompt feedback to infection control units may be helpful to implement control measures.

Procedures to contain or minimize dispersal of dust are necessary during construction activities. Examples include physical partitioning, rerouting of human traffic away from work areas, wet mopping and door mat placement at entrance, prompt debris removal, blocking and sealing of air vents where appropriate, and use of negative pressure at the construction sites.

## **10. 2 POLICY ON ENVIRONMENTAL SERVICES AND HOUSE KEEPING**

All Housekeeping personnel are educated on Infection Control and prevention including importance of Hand Hygiene, Standard Precautions, Laundry disposal, Waste disposal and disinfection. All personnel should comply with pre-employment and other employee health requirements Standard precautions should be maintained during all activities of patient care.

### **Role of Housekeeping Service**

- o Classifying the different hospital areas by varying need for cleaning
- o Developing policies for appropriate cleaning techniques
- o Procedure, frequency, agents used, etc., for each type of room, from highly contaminated to the most clean, and ensuring that these practices are followed
- o Developing policies for collection, transport and disposal of different types of waste
- o Ensuring that liquid soap and paper towel dispensers are replenished regularly
- o Informing the maintenance service of any building problems requiring repair: cracks, defects in the sanitary or electrical equipment, etc.
- o Caring for flowers and plants in public areas
- o Pest control (insects, rodents)

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- o Providing appropriate training for all new staff members and, periodically, for other employees, and specific training when a new technique is introduced
- o Establish methods for the cleaning and disinfection of bedding (e.g. mattresses, pillows)
- o Determining the frequency for the washing of curtains, screening curtains between beds, etc.
- o Reviewing plans for renovations or new furniture, including special patient beds, to determine feasibility of cleaning

### **Cleaning Methods**

- Cleaning should begin with the least soiled area and move to the most soiled area. Cleaning should progress from high to low surfaces. Work should either proceed clockwise or counter clockwise from the starting point.
- Walls, windows and doors including door handles shall be spot cleaned as needed and cleaned completely on a regular schedule. Room cleaning is done twice daily.
- Horizontal surfaces including tables, beds, chairs, ledges, lights and wall fixtures shall be wiped with a clean cloth dampened with disinfectant / detergent daily.
- Curtains shall be changed and cleaned every month and when soilage is apparent.
- Bathrooms shall be cleaned daily. Ceramic tiles and other hard surfaces should be free of mold.
- Housekeeping department is responsible for supplying hand washing at sinks. Only liquid soaps may be used in clinical areas. Reusable containers should be emptied, cleaned and dried before they are re-filled. "Topping up" is to be discouraged.
- Soiled linen shall be handled by using standard precautions. Refer to Policy for Laundry Disposal. Waste shall be collected from all areas at least daily. Refer to Policy for waste disposal.

### **Medium risk: Patient care areas**




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1. Inpatient rooms (occupied) – cleaned twice a day (Morning and evening).
  - a. The floor debris is collected using smarty mop.
  - b. Had stains on floor and walls are removed using nylon brush and cleaning agent if any.
  - c. Dustbins are emptied and cleaned with disinfectant solution and replaced with fresh duster clothes.
  - d. Toilet tiles are washed, washbasin is cleaned, toilet closet is scrubbed and toilet floor is mopped with disinfectant solution.
2. Discharge rooms:
  - a. Pest control spray is done as soon as the patient vacates the room.
  - b. High dusting (above shoulder height), spot cleaning of walls, windows and doors is done.
  - c. Fans and lights are cleaned with dry duster cloth.
  - d. Scrubbing and washing of room and toilet is done.
  - e. Curtains are changed if necessary.
3. Terminal cleaning (infected patient room cleaning)
  - a. Soiled linen is collected separately in water soluble bags.
  - b. Total room should be cleaned with 1% hypochloride solution
  - c. AC should be disinfected.
  - d. Curtains are removed and sent for washing.
  - e. Contact period should be provided as per the manufacturer recommendation of cleaning solution
4. Procedure rooms (Treatment rooms)
  - a. Routine cleaning of area is done twice a day.
  - b. Disposable paper sheet to be used on treatment couch.
5. Laboratories

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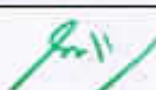

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- a. Routine cleaning of laboratories is done twice a day.
- b. Washing of labs is done weekly once.

**Low risk areas:**

- Routine cleaning (Sweeping, mopping, and dusting) of ward corridors, staircases are done twice a day and as when required.
- Washing of corridors and staircases is done during night.
- Offices, Conference Rooms, consultation rooms.
  - a. Routine cleaning is done once a day.
  - b. Waste clearance is done daily.
  - c. Washing of offices is done weekly once.

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## 11. STERILIZATION AND DISINFECTION

### 11.1 Introduction

The sterilization process provides the highest level of assurances that an item can be expected to be free of known viable pathogens and non pathogenic microorganisms, including spore. Bacteria spores are the most resistant of all living organisms due to the capacity to withstand external destruction agents.

### 11.2 Purpose

To monitor and enforce controls necessary to prevent cross infection according to infection control policies.

### 11.3 Definition

Sterilization - Is a process which achieves the complete killing or removal of all type of microorganism including spore

### 11.4 Methods of Sterilization

Selection of the agent used to achieve sterility depends primarily on the nature of the item to be sterilized. Sterilization process either physical or chemical and each method have its advantages and disadvantages. The following are available sterilizing agent:-

#### 11.4.1 Thermal (physical)

Steam under pressure/moist heat:-

Steam sterilizer in an autoclave is one of the most common form of sterilization.

Hot air /dry heat:- Rarely use.

#### 11.4.2 Chemical / cold sterilizers

Chemical sterilization is used for instruments and other items that are heat sensitive or when methods that require heat are unavailable.

- Ethylene oxide gas - its use should be discouraged.
- Hydrogen peroxide plasma/vapor/low Temperature Gas Plasma Sterilizers

It is use to sterilize metal and nonmetal surgical devices at low temperatures in a dry environment.

### 11.5 Monitoring the Sterilization Cycle

To ensure that instruments and supplies are sterile when used, it is essential that the sterilization process be monitored by.

#### 11.5.1. Administrative monitoring

- Work practices must be supervised.
- Written policy and procedures are strictly followed by all personnel responsible for sterilizing and handling sterile supplies.

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**Policies and procedures pertain to the following:**

- Decontaminating, cleaning and terminally sterilizing. - Packaging and labeling
  - Loading and unloading the sterilizer - Operating the sterilizer
  - Monitoring and maintaining the record of each cycle
  - Adhering to safety precaution and preventive maintenance protocol - Transporting sterile packages to the sterile storage room.
  - Cart should be enclosed.
  - Storage of sterile items
  - Handling of sterile items
- Tracking and recalling items if an item in a particular load is not safe for use.

**11.5.2 Mechanical Monitoring**

*Routine maintenance to check efficiency and accuracy of autoclave consist of the following:-*

- **Dummy Run**  
A complete sterilizing cycle carried out with an empty chamber to get rid of the remaining air in the chamber.
- **Recording Gauge**  
In the form of charts, printouts, or gauges, this reflects the current status of cycle parameters (pressure, temperature and duration) during sterilization. Gauge should be calibrated at regular intervals against standard instruments by autoclave operator.
- **Leak Rate Test**  
Pre vacuum steam sterilizer must be tested at least once a week for the rate of air leakage into the chamber during air removal and drying stages.
- **Thermocouple Test**  
To detect temperature achieved and maintained during sterilization stage.  
This procedure should be done during commissioning, after major repair and validation.
- **Bowie-Dick Test**  
Test packs are run daily, to monitor the function pre-vacuum sterilizers and check the efficacy of vacuum system.

**Policies and Procedures on Infection Control**

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### 11.5.3 Chemical Monitoring

To show that items have been exposed to sterilization process. The indicators (internal and external) help to monitor the physical conditions within the sterilizer and alert personnel to detect malfunction and improper packaging/loading. Indicators do not establish sterility of an item.

### 11.5.4 Biological Monitoring

- Positive assurance that sterilization conditions have been achieved can be obtained only through a biologic control test. Items should not be use if they do not pass the biological test.
- Consecutive biologic monitors should be run:
- Each time the sterilizer is calibrated
- After repairs
- During installation of sterilizer
- Relocated
- Preferably daily or at least once a week, and with each load of implants
- 3 hours test by CSSU or 48 hour by lab

### 11.6 Pre-Sterilization Process

- To achieve the sterilization process, the items to be sterilized should be pre-cleaned to lower the bio-burden to the lowest possible level.

### 11.7 Preparation for Sterilization

- Surgical instruments, supplies and most medical devices must be prepared and packed so that their sterility can be maintained to the point of use.

#### 11.7.1 Individual inspection and examination of instruments including

- Cleanliness
- Function of any instruments
- Integrity of instruments
- Lubricate and test for proper functioning

#### 11.7.2 Packaging and wrapping of used items prior to sterilization

- The packaging material chosen for sterile products must be nontoxic and conform with the following basic principles:-
- It must allow sterilant contact
- Allow sterile presentation of the package contents.
- Permeability to air, steam and gaseous

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- Policies and Procedures on Infection Control
- Able to stand heat / high temp.
- Resistance to penetration by microorganism
- Resistance to puncture and tear
- Good draping quality
- Free from loose fibers & particles
- Readily available

#### **11.7.3 Type of packaging materials**

- Sterilization wrapping paper
- Sterilization wrapping bag/pouches
- Linen wraps

#### **11.7.4 Sealing of Packs and Bags**

The purpose of sealing is to maintain pack integrity. It is achieved by the use of heat sealers or sterilizing indicator tape.

#### **11.8 Labeling**

- Use sterilisation non toxic marker pen for labelling
- Objective of labeling is to identify the contents, quality assurance, inventory control and stock-rotating purposes.
- Labeling should be done before sterilization process. Labeling shall indicate name of pack, code number of packer and date of sterilization.

#### **11.9 Loading the Load**

- The items should be arranged and placed on sterilizer rack leaving space for air and steam circulation.
- No items should touch the chamber walls.

#### **11.10 Unloading and Inspecting Sterile Items**

- The chemical indicator tape on each package should be checked for color changes.
- Check for the integrity of the pack
- The sterilized items must be cooled before storage

#### **11.11 Sterile Storage**

- Sterile items should be stored and handle in a manner that maintain the integrity of packs and prevent contamination from any source.
- The storage area shall be free of dust, insects and vermin.

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- All items shall be stored above floor level by at least 250mm and from ceiling fixtures by at least 440mm, 60 mm from the wall and protected by direct sun light.
- Temperature within the storage area should range from 18°C - 22°C with relative humidity from 35% - 70%.
- The sterile items should be arranged according to the size (big sets singly, and small set not more than 3 stacks)
- 'First in, First out' (FIFO) is the principle to follow in the removal and replacement of sterile items in sterile storage.

#### **11.12 Collection of Used Items**

- Where ever possible all decontamination must be performed in CSSU. In situation where it is not possible e.g. after office hours, the items should only be pre-rinsed to remove debris and then pack.
- Procedure for the collection of used reusable items from wards, operating room and other user department shall adhere to hospital guidelines.
- Personnel involved in collection and receiving should practice standard precaution when handling used instruments and devices.
- Instruments should be contained during transport from point of used to the area where they will be cleaned and decontaminated.
- Use a separate trolley for the collection of used items and the delivery of sterile items.
- The container or trolley shall be cleaned with disinfectant e.g. 70% alcohol at the end of each collection round.

#### **11.13 Distribution of sterile items**

Distribution trolley should be covered or closed to ensure the sterile chain is maintained

#### **11.14 Disinfection**

Disinfection is defined as the destruction of pathogenic and other kinds of micro-organization, but not necessarily all microbial form or spores. Depending on the intensity, it can be graded as low level disinfection, intermediate level disinfection or high-level disinfection. The choice of disinfection for an article is based on the nature of its use.

#### **Rules for the use of disinfectants**

1. Follow manufacturer's instructions
2. Check expiry date
3. Do not refill disinfectant containers – Topping NOT allowed
4. Do not use empty containers to store any other solutions

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### Recommendations

#### **A. Cleaning, disinfecting, and sterilizing patient care equipment:**

All objects to be high-level disinfected or sterilized and should be thoroughly cleaned to remove all organic matter (e.g., blood, tissue) and other residue.

#### **B. Indications for sterilization and high-level disinfection**

- Critical medical devices or pieces of patient care equipment that enter normally tissue or the vascular system or through which blood flows should be sterilized before each use.
- Equipment that touches mucous membranes (e.g., endoscopes, endotracheal tubes, anaesthesia breathing circuits, and respiratory therapy equipment) should receive high-level disinfection.
- Dental instruments that penetrate soft tissue or bone (e.g., forceps, scalpels, bone chisels, scalers, and burs) are classified as critical and should be sterilized or discarded after each use. Dental instruments that are not intended to penetrate oral soft tissue or bone (e.g., amalgam condensers, air-water syringes) but may come into contact with oral tissues are classified as semi critical and should be sterilized after each use.
- If the instrument could be damaged by the sterilization process, the instrument should be high-level disinfected. Noncritical surfaces, such as uncovered operatory surfaces (e.g., countertops, chair switches), should be disinfected between patients with an intermediate-level or low-level disinfectant.

#### **C. Chemical methods for sterilization**

When sterilization is indicated and other sterilization methods (e.g., steam or ETO) could not be used; any chemical sterilants may be used. The manufacturer's instructions for use will specify the recommended exposure time.

#### **D. Selection and use of high-level disinfectants for semi critical patient care items**

Solutions containing glutaraldehyde, hydrogen peroxide, chlorine, and peracetic acid can achieve high-level disinfection if objects are properly cleaned before disinfection. The disinfectant or chemical sterilant selected should have no or minimal deleterious effects on the object (e.g., chlorine may corrode metals)

#### **E. Selection and use of low-level disinfectants for noncritical patient care items**

Phenolics should not be used to clean infant bassinets and incubators during the stay of an infant. If phenolics are used to terminally clean infant bassinets and incubators, the surfaces

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should be rinsed thoroughly with water and dried before the infant bassinets and incubators are reused.

***F. Processing patient care equipment contaminated with HIV or HBV.***

Standard sterilization and disinfection procedures for patient care equipment are adequate to sterilize or disinfect instruments or devices contaminated with blood or other body fluids from persons infected with blood-borne pathogens, including HIV. No changes in procedures for cleaning, disinfecting, or sterilizing need to be made. Noncritical environmental surfaces contaminated with blood or bloody body fluids should be cleaned before a registered disinfectant / detergent is applied for disinfection. Persons cleaning spills should wear disposable gloves and other

**PROCEDURE FOR CLEANING AND DISINFECTION**

Sl.No	Equipment	Standard procedure
1	N 95 or standard surgical mask	After Use Discard in Yellow waste bag.

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2	Eye protector/goggles/face shield	If reusable: clean with detergent and water, dry, and disinfect with 70 % alcohol or soak in 1% hypochlorite solution for 20 minutes and rinse and dry. If disposable: discard in appropriate waste bag.
3	Gown	Soak in clean water with bleaching powder 0.5% for 30 minutes. Wash again with detergent and water to remove the bleach
4	Apron	Clean with detergent and water, dry, disinfect with 70% alcohol. If disposable: discard in appropriate waste bag.
5	Gloves	Discard in the appropriate waste bag
6.	Reusable boots	Clean with detergent and water, dry, disinfect with 70% alcohol.
7.	Needles and syringes Use disposable only	Discard in puncture proof container with international biohazard symbol.
8.	Soiled patient care equipment, e.g. stethoscope, blood pressure apparatus	Wipe with 70% alcohol and dried after cleaning. Always clean between patient use.
9.	Cuffs of blood pressure apparatus	Clean with soap and water followed by appropriate disinfectant. <u>If set aside for isolation room:</u> should remain in the isolation room until discharge of the patient when it must be decontaminated appropriately.
10.	Instruments	Remove all protein, organic, inorganic matter at point of generation (e.g. blood and body secretions) by cleaning with soap and water. Return to the sterilizing service department for appropriate reprocessing.
11.	Bedpans and urinals	After thoroughly cleaning with detergent, disinfect with hypochlorite [1000 ppm av cl <sub>2</sub> ] solution.
12.	Suction apparatus, oxygen flow meter.	Clean with sodium hypochlorite and dry. Must be heat sterilized. Change daily and in between each patient. Store dry when not in use.

SLNO	Equipment	Standard procedure
1	Furniture - bed, bed stand, couch, frames,	Clean with detergent and water and dry. Wipe with disinfectant such as 70% alcohol or 1%

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	table, I/V stand, wheelchair, etc.	sodium hypochlorite and dry after cleaning.
2	Mattress/pillows (always cover with plastic covers)	Clean with detergent and water between patients and as required. Wipe over with disinfectant such as 70% alcohol or 1% sodium hypochlorite.
3	Telephones, dressing trolleys	Clean with detergent and water, and dry. Disinfect with Fumispray or 70% alcohol daily.
4	Ventilator, suction equipment and mask	Clean exterior of machine with Fumispray. Filters should be single use and discarded. Mask is single patient use and should be cleaned at least daily and also as it becomes soiled.
5	Toys	Clean with detergent and water, and dry. If micro organism is transmitted via contact transmission such as SARS, VHF, MRSA, VRE, wipe with disinfectant or 1-2% hypochlorite solutions.

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## APPENDIX

### Appendix 1

#### POLCY ON NOSOCOMIAL INFECTIONS SURVEILLANCE

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Nosocomial infections are defined as localized or systemic conditions that result from adverse reactions to the presence of an infectious agent or its toxin and not present or incubating at the time of hospital admission. For most bacterial nosocomial infections the manifestation is 48 hours after hospital admission.

For purposes of surveillance and simplicity of recording monitoring and intervention, the nosocomial infections are divided into

- o Symptomatic UTI
- o VAP
- o Surgical site infections
- o LCBSI

**Surveillance**

This refers to the systematic collection, analysis and interpretation of data relating to nosocomial infections and prevailing trends of bacteria followed by dissemination of that information to those who can improve the outcome. Targeted surveillance is the method utilized with emphasis on the Critical Care Units.

**Surveillance of Nosocomial Infections:**

The surveillance data for nosocomial infection is presented as follows:

1. Number of catheter related urinary tract infection per month

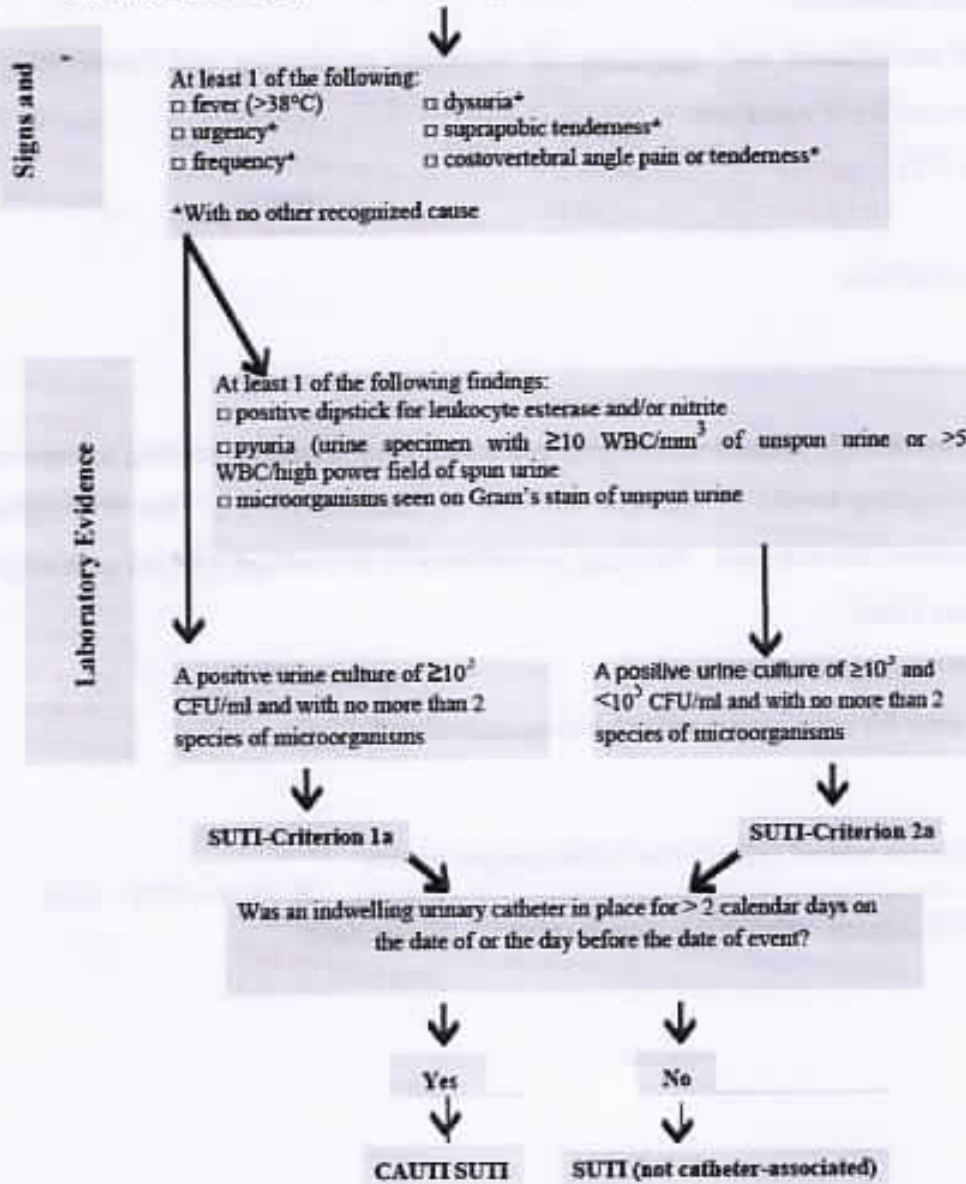
$$\frac{\text{No. of days with urinary catheter per month}}{\text{urinary catheter days}} \times 1000 = \text{UTI} / 1000$$

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### Identification and Categorization of SUTI When Indwelling Catheter has been removed

Patient had an indwelling urinary catheter removed the day of or the day before the date of event. Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day between two adjacent elements.



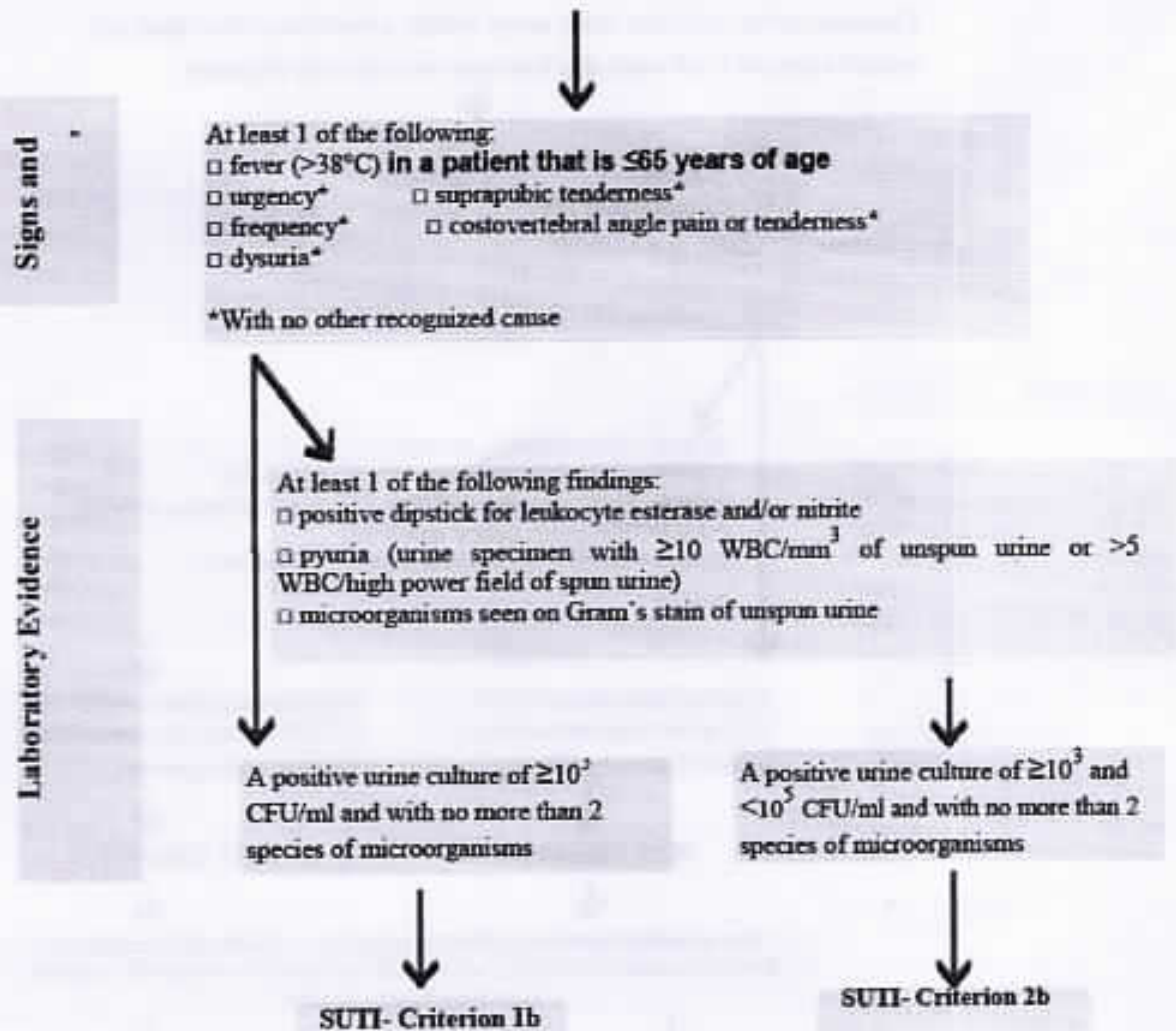
### Identification and Categorization of SUTI without Indwelling Catheter

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Patient did not have an indwelling urinary catheter that had been in place for >2 calendar days and in place at the time of or the day before the date of event. Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day between two adjacent elements.



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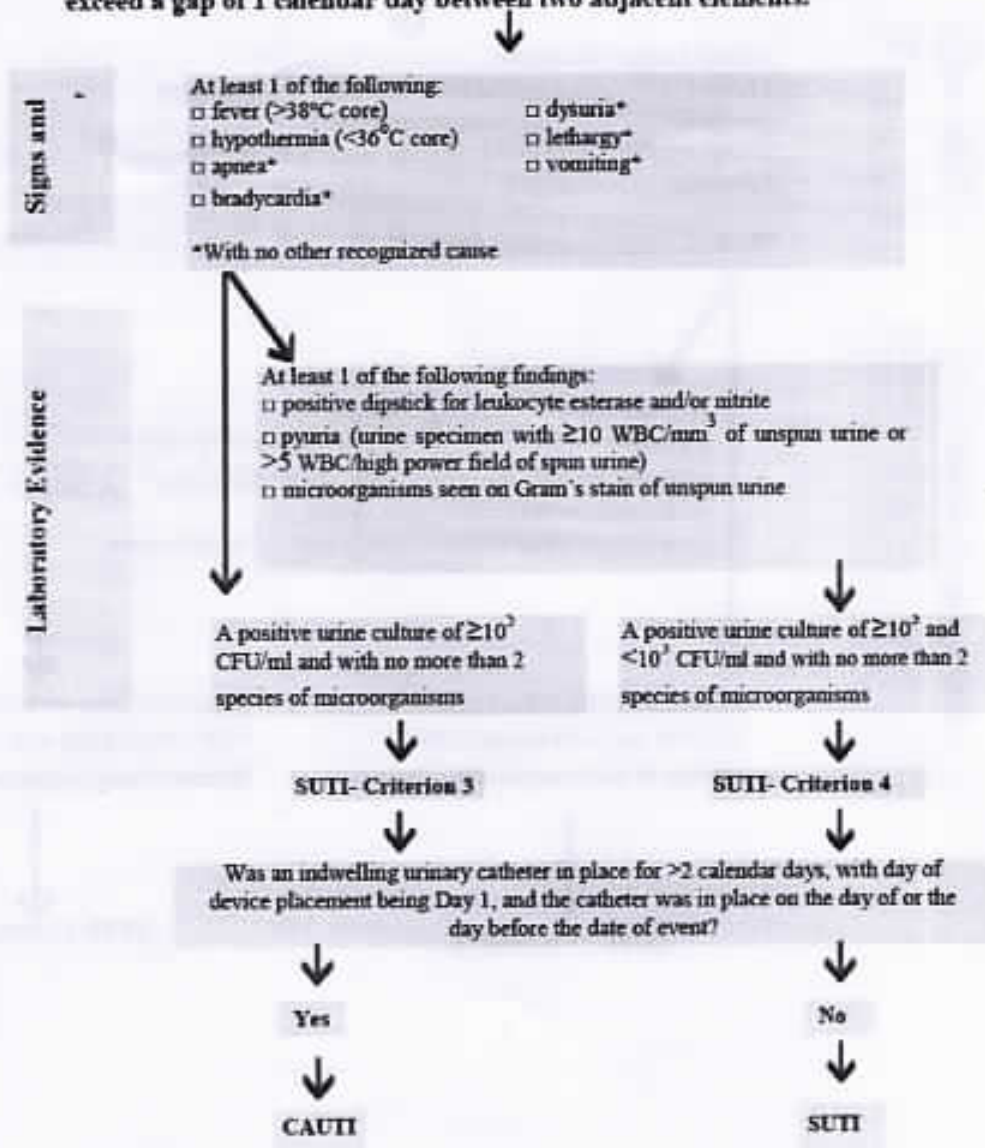


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**Identification and Categorization of SUTI in Patient  $\leq 1$  Year of Age  
Patient  $\leq 1$  year of age (with or without an indwelling urinary catheter)**

Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day between two adjacent elements.



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### Identification of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)

Patient with or without an indwelling urinary catheter

Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day between two adjacent elements.

Signs and Symptoms

Patient of any age  
 NONE of the following:  
— fever ( $>38^{\circ}\text{C}$ )  
— urgency  
— frequency  
— dysuria  
— suprapubic tenderness  
— costovertebral angle pain or tenderness

Patient  $\leq 1$  year of age  
 NONE of the following:  
— fever  $>38^{\circ}\text{C}$  core  
— hypothermia ( $<36^{\circ}\text{C}$  core)  
— apnea  
— bradycardia  
— lethargy  
— vomiting  
— dysuria

Culture Evidence

A positive urine culture of  $\geq 10^5$  CFU/ml and with no more than 2 species of microorganisms\*

A positive blood culture with at least 1 matching uropathogen microorganism\* to the urine culture or at least 2 matching blood cultures\*\*\* drawn on separate occasions if the matching pathogen is a common skin commensal.

Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)

Was an indwelling urinary catheter in place for  $>2$  calendar days, with day of device placement being Day 1, and the catheter was in place on the day of or the day before the date of event

Yes

No

ABUTI (catheter-associated)

ABUTI (not catheter-associated)

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