



# Infection Prevention & Control Manual

2<sup>nd</sup> Edition

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Gulf Cooperation Council – Centre for Infection Control  
Riyadh 22490, Kingdom of Saudi Arabia

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# MESSAGE

from the

## CHIEF EXECUTIVE OFFICER

**I**t is with utmost enthusiasm that I would like to congratulate all members of the GCC Centre for Infection Control (CIC) on the release of the second (2<sup>nd</sup>) edition of the Infection Prevention & Control Manual. This has been a successful journey for the GCC-CIC Team as they have established a truly helpful, effective, and comprehensive manual touching the core of patient safety. The National Guard Health Affairs' King Abdulaziz Medical City in Riyadh continue to host and support the GCC Centre for Infection Control and will provide in its full capacity the assistance needed for the countries fruition of their activities and achievements to the utmost for the activities of the Centre.

This updated second edition of the Infection Prevention & Control Manual proves to be a valuable publication as it provides a positive resource for all infection control preventionists and healthcare facilities to significantly improve the quality, well-being, and patient safety of all.

We are proud of such an accomplishment borne out of the collaborative efforts among GCC States. I would like to extend my gratitude to each and everyone in the GCC-CIC Advisory Board and their staff for their continuing efforts and contributions in propelling the progress and success of the GCC Centre for Infection Control.

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# FOREWORD

**In** *All humility, we acknowledge Your aid, O Allah. Without your guidance, love and cause, this humble contribution would never become a reality.*

With immense pleasure, we are presenting to the GCC States this second (2<sup>nd</sup>) edition of the GCC-Centre for Infection Control (CIC) Infection Prevention & Control Manual, duly adopted during the Health Ministers 64<sup>th</sup> Conference (Riyadh: 5-6/2/2008) and ratified in the 2013 Annual Advisory Board Meeting of the GCC-CIC (Riyadh: 27-30/1/2013).

Designed to give up-to-date guidelines for the GCC States, this manual provides evidence-based infection control practices for all healthcare setting. The consistent application of proper infection control principles and practices instilled in all healthcare activities is necessary to achieve patient safety and the best patient outcomes.

This updated manual's policies and procedures are highly commendatory as it addresses better ways to manage particular patient populations; properly detect significant microorganisms, or airborne transmission risks which are detrimental to a safe environment; and the correct procedures to conduct Hand Hygiene techniques, aseptic techniques, medical waste management, employee health, and management of patient with multidrug resistant organisms; as well as, many more methodologies that will ensure high standards in healthcare delivery.

These policies and procedures when incorporated into the fabric of each healthcare facility functions should yield a healthy and safe environment for patients, staff, and visitors.

The GCC Health Minister's Council wishes to encourage its members to continue to strive for excellence in the prevention of healthcare associated infections and improved safety for all who interface with its healthcare facilities through partnership activities.

In conclusion, I ask the Almighty Allah to well accept this deed and make it purely for Him. Allah is the Guidance to the Straight Path.

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Gulf Cooperation Council (GCC) States

# PREFACE

**The** GCC Centre for Infection Control (CIC) has completed the updates for the 2<sup>nd</sup> edition of the Infection Prevention & Control Manual. The field of patient safety, specifically infection prevention and control, has been rapidly expanding and there is a global and urgent need to support infection prevention programs around the world with the utilization of appropriate tools, policies, and procedures to reflect best healthcare practices.

In the second edition of the GCC-CIC Infection Prevention & Control Manual, all of the previous policies were reviewed and edited to reflect updates in infection control (IC) practices. In addition, this manual aims to address other important requirements in improving and maintaining safe and healthy facilities, hence, a new section on Environmental Health was included to expand on the expert information and guidance that is needed to implement infection prevention and control strategies in healthcare institutions in the Gulf Countries.

Current trend demands proper management of certain patient populations and early detection of significant microorganisms, or airborne transmission risks. It is highly important that information and guidelines are readily available, hence, additional policies on negative pressure room monitoring, rapid MRSA surveillance, animal research, and hematopoietic stem cell transplantation have been added in the second edition.

A user guide has also been introduced in this manual to facilitate proper utilization by Infection Control Programs in the GCC member States healthcare facilities. Property right remains with the GCC Centre for Infection Control (CIC) – National Guard Health Affairs, as such, in accordance with international copyright standard, the manual may not be reviewed or translated without the prior approval of the GCC-CIC.

Any additions, deletions, and/or revisions must be done in consultation with the Director of the GCC-CIC. Should there be any conflict of these policies with the existing GCC member State's legislation, the specific member State's legislation should take precedence and such issue discussed with the Director of the GCC-CIC.

Any omission of procedures related to infection prevention and control from this manual does not imply that they are not recommended by the GCC-CIC and should be brought to the attention of the Director of GCC-CIC.

**Hanan Balkhy, MD, MMed, FAAP, CIC**

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# Introduction: User Guide

**As** a reference guide for easy use of this manual, the following policy titles were modified from the first edition to this updated version for better clarity and content relevance as follow:

SECTION	PAGE	NEW TITLE	OLD TITLE
III-02	37	Isolation (Expanded) Precautions	Expanded Precautions
III-10	64	Patients and Sitters in Isolation: IC Education and Compliance	Patients and Sitters Not Complying with Isolation Precautions
V-02	101	Screening and Treatment of Tuberculosis in Healthcare Workers	Contract Tracing, Screening, and Treatment of TB in HCWs
VII-4	171	Management of Occupational Exposure to HBV, HCV, and HIV	Management of Needlestick Injuries /Blood ad Body Fluid Exposure
IX-1	247	Sterile Supplies and Equipment Management	Cleaning, Disinfection, and Sterilization
IX-2	252	Waste Management	Infectious Waste Management
IX-3	257	Single Use Devices (SUD)	Reprocessing/Reuse of Disposable Items

As we are forced to address the management of certain patient populations, early detection of significant microorganisms, or airborne transmission risks, it is important that information and guidelines are readily available. The following policies were added in the hopes of meeting some of the abovementioned needs:

SECTION	PAGE	NEW TITLE
III-11	37	Negative Pressure Room Monitoring
IV-10	64	Rapid MRSA Surveillance
VII-6	171	Hematopoietic Stem Cell Transplantation (HSCT)
VIII-11	247	Animal Research

Furthermore, Section 10: Environmental Health was added in this revised manual to provide procedures on how to manage other important requirements in order to improve and maintain safe and healthy facilities. This section includes the following policies:

SECTION	PAGE	NEW TITLE
ICM - X-01	263	Water Quality Monitoring Program and Requirements
ICM - X-02	268	Hemodialysis Water Quality Monitoring
ICM – X-03	271	Hazardous Chemical Gases and Sampling
ICM – X-04	273	Microbial Air Sampling in Patients' Areas
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ICM – X-06	278	Food Hygiene
ICM – X-07	284	Housekeeping
ICM – X-08	289	Pest Control
ICM – X-09	297	Infection Prevention and Control Procedures for Hospital and Healthcare Facility Construction / Renovation

# Gulf Cooperation Council-Center for Infection Control (GCC-CIC) Mission Statement

## INTRODUCTION

The Gulf Cooperation Council (States) Centre for Infection Control takes its direction from National Guard Health Affairs, King Abdulaziz Medical City-Riyadh, (KAMC-R).

## SCOPE OF SERVICES

The scope of service of the Infection Control Program supports all the services provided and comprises--hospital infection, environmental health, occupational safety, and field epidemiology and public health--all structured within the Department of Infection Prevention and Control. It functions to support a high quality of care through the prevention and control of infections and infectious diseases using epidemiologic and quality improvement methodologies, evidence-based healthcare, education, research and collaboration.

As the Gulf Cooperation Council (States) Centre for Infection Control, so appointed at the 58th Meeting of the Ministers of Health for the GCC States, its scope of service is widened beyond the confines of KAMC-R to all healthcare facilities in the Gulf State countries. In an attempt to clarify this role and expanded scope, and to develop a framework, to guide its activities, a proposal was formulated and submitted for review and approval; thus formalizing the GCC (States) Centre for Infection Control.

## CORE VALUE

Do No Harm

## VISION

Excellence and safety in healthcare delivery everywhere in the Gulf States and beyond, through cooperation and the establishment of long-lasting links between our developing programs in the region.

## MISSION

To subscribe to regional and international leadership in the fight against healthcare related infections and those diseases, which threaten mankind and seriously affect the concerns of health and economics of our populations. Our approach is collaborative as we bring to the region, new findings, fresh concepts and dynamic theories that will be the building blocks to further advance our cause.

## GOALS AND OBJECTIVES

### Short Term:

1. Establish an Advisory Board, which is representative of all GCC States with specific terms of reference to give guidance in the execution of the center's mandate, which is represented by all GCC member states.
2. Develop regional standards for the practice and certification of infection control.
3. Provide professional development with CME and practical experience for the training of infection control professional.
4. Provide a forum for pooling of expertise and highlighting activities to address infection control issues in the region.
5. Formulate a system of communication to disseminate information (local and global news on infection control) in a timely manner to all members.
6. Create, promote and support networks among infection control professionals in the region and globally.
7. Coordinate and collaborate annual meetings and symposia to provide a forum for the exchange and update of scientific information among concerned individuals.

### Long Term:

1. Establish regional databases to support research activities and encourage benchmarking among member states institutions.
2. Initiate a society / organization for GCC States Infection Control professionals and encourage / support the development of similar groups in each member country.
3. Establish an internationally recognized journal with an editorial board for the review, selection and publication of relevant articles.
4. Facilitate the publication of a peer reviewed and indexed scientific journal to address infection control and related issues in the region.
5. Develop an accreditation system to survey healthcare facilities to ensure that national and regional standards of care are met and assist facilities in seeking international accreditation.

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## Section 1: POLICY

<b>Section</b>	<b>Title</b>	<b>Page #</b>
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<b>TITLE/DESCRIPTION:</b> <b>JOINT COMMISSION ON ACCREDITATION OF HEALTH ORGANIZATION (JCAHO) STANDARD SURVEILLANCE PREVENTION AND CONTROL OF INFECTIONS (PCI)</b>		<b>INDEX NUMBER:</b> <b>ICM – I-01</b>
<b>EFFECTIVE DATE:</b> 01/01/2009 01/01/2013	<b>APPLIES TO:</b> <b>All GCC Countries</b>	<b>ISSUING AUTHORITY:</b> <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## STATEMENT

Surveillance, prevention and control of infection cover a broad range of processes and activities carried out by the organization's Infection Prevention and Control Department to identify and reduce risks of acquiring and transmitting infections among patients, staff, healthcare professionals, contract workers, volunteers, students, and visitors.

This function also involves links to external organization support systems to reduce the risk of infection from the environment, including food and water sources.

This function coordinates all activities related to the control and prevention of healthcare-associated infections (HAIs) as well as infections brought into the hospital.

## STANDARDS

The following is a list of the Prevention and Control of Infections (PCI) standards for this function as outlined by the Joint Commission International Accreditation (JCIA) Standards for Hospitals:

- PCI.1** One or more individuals oversee all infection prevention and control activities. This individual(s) is qualified in infection control practices through education, training, experience or certification.
- PCI.2** There is a designated coordination mechanism for all infection control activities that involves physicians, nurses, and others as appropriate to the size and complexity of the organization.
- PCI.3** The infection control program is based on current scientific knowledge, accepted practice guidelines, and applicable law and regulation.
- PCI.4** The organization's leaders provide adequate resources to support the infection control program.
- PCI.5** The organization designs and implements a comprehensive program to reduce the risk of healthcare-associated infections in patients and healthcare workers.
  - PCI.5.1 All patient, staff, and visitor areas of the organization are included in the infection control program.
- PCI.6** The organization establishes the focus of the healthcare-associated infection prevention and reduction program.
- PCI.7** The organization identifies the procedures and processes associated with the risk of infection and implements strategies to reduce infection risk.

- PCI.7.1 The organization reduces the risk of infections by ensuring adequate equipment cleaning and sterilization and the proper management of laundry and linen.
  - PCI.7.2 The organization reduces the risk of infections through proper disposal of waste.
  - PCI.7.3 The organization has a policy and procedure on the disposal of sharps and needles.
  - PCI.7.4 The organization reduces the risk of infections in the facility associated with operations of food service and of mechanical and engineering control.
  - PCI.7.5 The organization reduces the risk of infection in the facility during demolition, construction and renovation.
- PCI.8** The organization provides barrier precautions and isolation procedures that protect patients, visitors and staff from communicable diseases and protects immunosuppressed patients from acquiring infections to which they are uniquely prone.
- PCI.9** Gloves, masks, eye protection, other protective equipment, soap, and disinfectants are available and used correctly when required.
- PCI.10** The infection control process is integrated with the organization's overall program for quality improvement and patient safety.
- PCI.10.1 The organization tracks infection risks, infection rates, and trends in healthcare-associated infections.
  - PCI.10.2 Monitoring includes using indicators related to infection issues that are epidemiologically important to the organization.
  - PCI.10.3 The organization uses risk, rate, and trend information to design or modify processes to reduce the risk of healthcare-associated infections to the lowest possible levels.
  - PCI.10.4 The organization compares its healthcare-associated infection rates with those of other organizations through comparative databases.
  - PCI.10.5 The results of infection monitoring in the organization are regularly communicated to its leaders and staff.
  - PCI.10.6 The organization reports information about infections to appropriate external public health agencies.
- PCI.11** The organization provides education on infection control practices to staff, doctors, patients, and, as appropriate, family and other caregivers.

TITLE/DESCRIPTION: <b>INFECTION CONTROL COMMITTEE RESPONSIBILITIES</b>		INDEX NUMBER: <b>ICM – I-02</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## STATEMENT

Responsibility for the prevention and control of infections within the healthcare facility and for the evaluation of the infectious potential of the related environment is vested in a multidisciplinary committee under the aegis of the medical staff.

The Infection Control Committee coordinates an objective and systematic review process to evaluate the quality and appropriateness of patient care as it relates to infection prevention and control.

## PURPOSE

To coordinate and supervise the activities of the Infection Prevention and Control Program and to communicate with all departments of the organization to ensure the program is continuous and proactive.

## RESPONSIBILITIES

1. Pursue opportunities to improve patient care and clinical performance.
2. Recommend practices to resolve identified infection control problems in care and performance.
3. Recommend corrective actions to governing bodies when necessary.
4. Approve the type and scope of surveillance activities including stratified infection risk, focused infection studies, and prevalence and incidence studies.
5. Determine the amount of time required to conduct infection surveillance, prevention and control activities based on several parameters:
  - a. Needs of the patient population.
  - b. Risk factors of the patient population.
  - c. Complexity of the services.
  - d. Educational needs of the personnel.
  - e. Resource and support services available.
6. Determine the appropriate definitions and criteria to recognize the existence of healthcare-associated infection (HAIs).
7. Establish a review process that is directed to detect epidemics, clusters of infections and incidences of infections above the usual baseline levels.
8. Conduct at least annual reviews of the data trend analysis generated by surveillance activities during the past year as well as the effectiveness of prevention and control intervention strategies in reducing nosocomial infection risks and priorities or problems identified in the past year.
9. Initiate and conduct epidemiological investigations relating to infection prevention and control of infection incidents.
10. Establish, review, and approve, at least every two years, all policies and procedures related to infection surveillance and prevention and control activities in all departments/services.
11. Review and approve the cleaning procedures, agents and schedules that are used throughout the hospital. This review is to be done biannually or more frequently if necessary.

## STRUCTURE

The committee consists of multidisciplinary team members.

Membership includes representation from the Medical, Administration, Nursing, Microbiology, Quality Improvement, and Infection Control Departments (the last should include those individuals directly responsible for the management of the infection surveillance and the prevention and control program).

Representation from ancillary departments is available for consultative purposes as discussion items dictate.

Membership is selected from:

- Dept. of Internal Medicine - Infectious Disease Specialist
- Dept. of Family Medicine (Employee Health)
- Dept. of Surgery
- Dept. of Obstetrics/Gynecology
- Dept. of Pediatrics
- Health Affairs
- Hospital Administration
- Microbiology Laboratory
- Dept. of Infection Prevention and Control:
  - Infection Control Practitioner(s)
  - Environmental Health Specialist
  - Occupational Health Safety Specialist
- Dept. of Nursing Services Operating Room
- Quality Improvement - Health Affairs
- Others
  - Guests from other departments such as:  
Housekeeping, Laundry, Cardiopulmonary, and CSSD are invited on an ex officio basis when matters pertaining to their services are to be discussed.

## PROCEDURE

### A. Meeting

The Committee meets quarterly or as scheduled in each hospital and healthcare facility. Special meetings will be called by the Chair when circumstances dictate.

**NB:** All matters to be addressed by the Committee should be brought to the attention of the Chairperson, infection control practitioner (ICP), and/or the appropriate Committee member.

### B. Documentation

Discussions, conclusions, recommendations, assignments, actions, and approvals are documented in the minutes of the Committee meetings.

Minutes are distributed to each Committee member and are forwarded to other appropriate staff through the Administrative Advisory Committee.

TITLE/DESCRIPTION: <b>STATEMENT OF AUTHORITY</b>		INDEX NUMBER: <b>ICM – I-03</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## STATEMENT

The Infection Control Committee (ICC), through its chairperson and members, is vested with the responsibility and authority to institute any appropriate prevention and control measure when it is reasonable to presume that an infectious risk to any patient or personnel exists.

The Director for the Infection Prevention and Control Program of the institution has the responsibility and authority to establish policies and procedures for the instruction of its personnel and for the overall supervision of infection prevention and control activities in its facilities.

## PROCEDURE

This statement of authority is reviewed and authenticated at least every two years by the Administration of the institution.

APPROVAL – TITLES	DATE
_____ Executive Director (Head), Infection Prevention and Control	_____
_____ Executive Director (Head), Medical Services	_____
_____ Chief Executive Officer	_____

TITLE/DESCRIPTION: <b>INFECTION PREVENTION AND CONTROL PROGRAM</b>		INDEX NUMBER: <b>ICM – I-04</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## STATEMENT

The organization establishes and maintains a comprehensive program for infection prevention and control within the standards of the JCI, the recommendations of the Centers for Disease Control and Prevention (CDC) and the guidelines of the respective country's Ministry of Health (MOH).

## PURPOSE

To develop policies and procedures to guide and instruct healthcare personnel on the practices to prevent and control healthcare-associated and work related infections.

## PROCEDURE

The program is supervised by the Infection Control Committee and provides several services:

- Surveillance (healthcare-associated infections)
- Education
- Consultation
- Outbreak and Exposure Investigation
- Environmental Health
- Occupational Health and Safety (Employee Health)
- Acting as a Liaison

The program adapts the system of Standard Precautions, which emphasizes the need to consider all body substances as potentially infectious regardless of the patient's diagnosis.

In adapting this approach to infection prevention and control, the Infection Control Committee has carefully considered each policy and procedure in order to provide the following:

- Protection
- Feasibility
- Consistency
- Efficiency
- Cost Effectiveness

An ongoing program of theory and practice for continuing education is a major requirement and mandate. Therefore, education, reminders, and instruction on infection prevention and control practices and the principles of Standard Precautions are available for all categories of staff, patients, families and sitters through the Infection Control Department.

<b>TITLE/DESCRIPTION:</b> <b>REPORTING COMMUNICABLE DISEASES TO THE  MINISTRY OF HEALTH</b>		<b>INDEX NUMBER:</b> <b>ICM – I-05</b>
<b>EFFECTIVE DATE:</b> 01/01/2009 01/01/2013	<b>APPLIES TO:</b> <b>All GCC Countries</b>	<b>ISSUING AUTHORITY:</b> <b>GULF COOPERATION COUNCIL –  CENTRE FOR INFECTION CONTROL  (GCC-CIC)</b>

## DEFINITION

Each health authority designates the communicable diseases to be reported by healthcare facilities. This is necessary for proper epidemiology protocols, monitoring, education and institution of appropriate local and national control measures.

## FORMS

Reporting forms and documents as stipulated by each Gulf State authority.

## COMMENTS

Compliance with this policy and procedure must be within the scope and responsibility of the designated persons.

## PROCEDURE

To be outlined and carried out as per institution and local health authority guidelines.



## Section 2: STANDARD INFECTION CONTROL POLICIES

<b>Section</b>	<b>Title</b>	<b>Page #</b>
ICM – II-01	<b>Reporting Infections and Infection Concerns</b>	<b>11</b>
ICM – II-02	<b>Requesting Infection Control Review and Consultation</b>	<b>12</b>
ICM – II-03	<b>Standard Precautions</b>	<b>13</b>
ICM – II-04	<b>Hand Hygiene</b>	<b>17</b>
ICM – II-05	<b>Aseptic Technique</b>	<b>26</b>
ICM – II-06	<b>Therapeutic Procedures</b>	<b>31</b>



TITLE/DESCRIPTION: <b>REPORTING INFECTIONS AND INFECTION CONCERNS</b>		INDEX NUMBER: <b>ICM – II-01</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines for raising significant infection concerns to the Infection Prevention and Control Department.

## COMMENTS

All employees must be able to participate in the infection monitoring and reporting process.

All employees having knowledge of an infectious process are required to report that infection to the Infection Control Staff. Any environmental condition(s) that may contribute to an infection must also be reported to the Environmental Health Specialist.

## PROCEDURE

Notify the Infection Control Staff responsible for your area of any patient admitted with an infection or a communicable disease and/or who develops an infection after admission.

Notify the Infection Control Staff and Environmental Health Specialist of any environmental condition(s) that could contribute to an infection.

Call the Infection Prevention and Control Department or page the Infection Control Staff, and include the following information:

### A. Patient condition(s)

- Medical record number
- Patient name
- Patient location
- Type of infection concern(s)

### B. Environmental condition(s)

- Location
- Type of Infection Control concern
- Person(s) at risk

TITLE/DESCRIPTION: <b>REQUESTING INFECTION CONTROL REVIEW AND CONSULTATION</b>		INDEX NUMBER: <b>ICM – II-02</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

Infection Control activity works in tandem with all healthcare disciplines to provide quality patient care through education and practical application of the principles of microbiology, epidemiology and infection prevention and control.

## COMMENTS

Infection control is **Everyone’s Responsibility**, but the scope and magnitude encompassed by Infection Control requires a “key person” to coordinate the activities of the program. The Infection Control Practitioner (ICP) is that “key person.”

The Infection Control Staff must have knowledge and expertise in microbiology, epidemiology, sterilization and disinfection, infectious diseases, antiseptic usage, clinical practices and statistics to function in this pivotal role as educator, investigator, researcher, patient advocate, agent of change, consultant, statistician, sanitarian, role model, coordinator, and diplomat.

## PROCEDURE

Request infection control review and consultation as they relate to infection prevention and control activities such as:

- Surveillance
- Investigation
- Research
- Statistics
- Education
  - a. Staff
  - b. Patient
  - c. Visitors

TITLE/DESCRIPTION: <b>STANDARD PRECAUTIONS</b>		INDEX NUMBER: <b>ICM – II-03</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines on the basic infection control practices to prevent the transmission of infectious agents during patient-healthcare worker daily interactions.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18: Isolation Precautions. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Center for Disease Control and Prevention (CDC). Guidelines for environmental infection control in healthcare facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). *MMWR* 2003;52(RR10);1-42
3. CDC. Cluster of severe acute respiratory syndrome (SARS) among protected healthcare workers-Toronto, Canada, April 2003. *Morbidity Mortality Weekly Report (MMWR)* 2003;52(19):433-6
4. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007

## COMMENTS

- Delivery of healthcare in *all* settings—e.g., acute care hospitals, long-term care facilities, ambulatory care centers, and the home—is associated with a risk for transmission of infectious agents, via other patients and healthcare workers or in association with medical devices.
- Standard Precautions is used to break the chain of infection transmission and is used in conjunction with Isolation Precautions.
- A method of infection prevention and control in which all human blood and body substances (blood, body fluids, secretions, excretions, non-intact skin and mucous membranes) are considered potentially infectious.
- The basic requirements for infection prevention and control strategies such as strict hand hygiene will reduce spread of microorganisms.
- Adherence to aseptic techniques and appropriate use of Personal Protective Equipment (PPE).
- Designed to be used for the care of all patients (regardless of their diagnosis or presumed infection status), all personnel, and visitors.

## PROCEDURE

### A. Hand Hygiene (HH)

Methods of HH involve either antibacterial soap and water or alcohol-based waterless hand rub.

HH is used to remove or kill microorganisms that colonize the hands.

#### The WHO's 5 moments for HH:

1. Before patient contact
2. Before aseptic tasks
3. After body fluid exposure risk
4. After patient contact
5. After contact with patient surroundings/environment

Refer to policy [ICM-II-04](#) *Hand Hygiene*

### B. Personal protective equipment (PPE)

PPE is used to create a barrier between HCWs and patients, substances, or surfaces.

Use appropriate PPE (gloves/gowns/plastic aprons/eye protection) to prevent skin and mucous membrane exposure. Use one or more of these items based on the degree and risk of exposure. However, most routine patient care activities at the bedside do not require the use of PPE.

1. Gloves
  - a. Wear gloves whenever in contact with blood, other body substances or contaminated items and surfaces and when in an isolation room.
  - b. Wear and change gloves between tasks/procedures on the same patient.
  - c. Remove gloves promptly after use and before touching clean items and environmental surfaces.
  - d. Perform hand hygiene immediately after removing gloves.
  - e. Gloves are not to be worn after leaving the patient room or procedure area.
  - f. Use non-sterile gloves for examinations and other clean procedures, and use sterile gloves for sterile procedures.
2. Gowns/plastic aprons
  - a. Wear a gown/plastic apron to protect skin and clothing during procedures that may generate splashes or aerosolization of body substances and cause the soiling of clothes.
  - b. Securely fasten the tabs/ties to keep the gown/plastic apron in place while performing patient care activities in the patient room/procedure area.
  - c. Remove the gown/plastic apron by untying the tabs/ties and folding it away from you in an inside-out manner. Roll it into a ball and discard.
  - d. Change the gown/plastic apron for each patient and/or procedure.
  - e. Gowns/aprons are not to be worn after leaving the patient room or procedure area.

3. Mask (surgical or N95)
  - a. Wear a surgical mask (with protective eye/face wear) if splashing or aerosolization of blood or body fluids is expected.
  - b. Change mask between patients and sooner if mask becomes wet, moist or torn.
  - c. Wear an N95 mask when indicated to enter an airborne isolation room, and remove it only when outside of the room.
4. Protective eye/face wear
  - a. Wear protective eye/face wear if required for combined protection from eye/face contamination by aerosolized body substances.
  - b. Wash and disinfect visibly soiled reusable face shields or protective eyewear prior to reuse.

### C. Handling/disposal of contaminated items

1. Needles/sharps
  - a. Dispose of used sharp items in an approved puncture-resistant container immediately after use, at the point of use or as close to point of use as possible.
  - b. Do not place used sharp items on any environmental surface.
  - c. Do not recap or manipulate needles using both hands because this increases the risk of injury. If recapping or manipulation of the needle is deemed essential, then use either a one-handed “scoop” technique or a mechanical device designed to hold the needle sheath.
  - d. Before attempting to remove needles from reusable aspirating syringes, recap them with either a one-handed “scoop” technique or a mechanical device designed to hold the needle sheath.
  - e. Close sharps containers when  $\frac{3}{4}$  full and remove for incineration.
2. Linen
  - a. Linen should be handled and transported in a manner to prevent skin/mucous membrane exposure and contamination of clothing or transferring microorganisms to other patients or the environment.
  - b. Place wet/heavily soiled linen in a designated impermeable bag and close the bag securely or wrap wet linen in another piece of linen to avoid soaking of the bag.
  - c. Refer to policy [ICM-VIII-02 Laundry](#) for details.
3. Medical waste
  - a. Place biomedical waste in identifiable (color-coded) bags or appropriate containers.
  - b. Securely tie or close bags/containers and remove for appropriate disposal.
  - c. Refer to policy [ICM-IX-02 Waste Management](#) for details.
4. Patient care equipment
  - a. Handle used patient care equipment in a manner that prevents skin and mucous membrane exposure, contamination of clothing and transfer of microorganisms to other patients or the environment.
  - b. Commonly used equipment must be clean and disinfected between patients.
  - c. Do not reuse single-use disposable equipment.
  - d. Ensure that reusable equipment is properly transported in leak-proof containers to CSSD for reprocessing before use with another patient.

**D. Laboratory specimens**

1. Handle all specimens with gloves.
2. Place laboratory specimens in designated, appropriately sealed containers.
3. Label containers with appropriate patient data.
4. Transfer to the laboratory in an upright position as promptly as possible.
5. Ensure that the requisition has the complete information (i.e., specification site, which is critical for lab analysis and clinical interpretation).

**E. Room cleaning**

1. Rooms should be cleaned daily and after patient discharge.
2. Cleaning is required as per housekeeping policies.

**F. Patient placement**

1. Place patients who pose a risk of transmission to others (e.g., those with uncontained secretions, excretions, or wound drainage or infants with suspected viral respiratory tract or gastrointestinal tract infections) in single-patient rooms when available.

**G. Cough etiquette**

1. Cover nose and mouth with a tissue when coughing or sneezing.
2. Dispose of the used tissue in the nearest waste receptacle.
  - a. Clean hands with soap and water or antiseptic solution or with an alcohol-based hand rub after touching respiratory secretions or handling contaminated objects.

TITLE/DESCRIPTION: <b>HAND HYGIENE</b>		INDEX NUMBER: <b>ICM – II-04</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To emphasize the importance of hand hygiene (HH) in prevention disease transmission and to the indications and techniques needed.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 19: Hand Hygiene. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. WHO Guidelines on Hand Hygiene in Healthcare 2009 (World Alliance for Patient Safety)

## COMMENTS

1. Hands may easily become contaminated with infectious microorganisms, which can enter the body through a break in the skin or be transmitted to a susceptible host and cause infection.
2. All personnel, physicians, nurses, technicians and others who are responsible for complying with the hand hygiene policy should lead by example and call observed infractions to the attention of any offenders.
3. Artificial nails and chipped nail polish may be associated with an increase in the number of bacteria on finger nails and should not be used.
4. **Resident flora (resident bacteria)** refers to the microorganisms residing under the superficial cells of the stratum corneum and also found on the surface of the skin.
5. **Transient flora (transient bacteria)** refers to the microorganisms that colonize the superficial layers of the skin and are easily removed by routine hand hygiene.

## PROCEDURE

### A. Indications for HH

#### **Clean your hands:**

1. Before touching a patient
2. Before clean/aseptic procedures
3. After body fluid exposure risk
4. After touching a patient
5. After touching patient's surroundings

#### **Other Opportunities for Hand Hygiene**

1. When hands are visibly soiled
2. After contact with a source of microorganisms (body fluids and substances, mucous membranes, non-intact skin, surfaces that are likely to be contaminated)
3. After removing gloves

4. Before and after smoking, eating or preparing food
5. Before leaving the patient's room
6. After bodily functions (e.g., using the toilet, blowing one's nose, sneezing)
7. When moving from a contaminated body site to a clean body site during patient care

Hands and other skin surfaces exposed to blood or body fluids must be cleansed as soon as patient safety permits.

## B. Techniques

(Refer to Appendices 1 and 2)

### **Hand washing**

Wash hands for a minimum of **40-60 seconds**

1. Remove excess jewelry
2. Select a comfortable water temperature
3. Wet hands with running water
4. Apply soap to cover all surfaces of the hands
5. Rub hands palm to palm
6. Right palm over left dorsum with interlaced fingers and vice versa
7. Palm to palm with fingers interlaced
8. Backs of fingers to opposing palms with fingers interlaced
9. Rotational rubbing of the left thumb clasped in the right palm and vice versa
10. Rotational rubbing backward and forward with clasped fingers of the right hand in the left palm and vice versa
11. Rinse the hands with running water to remove all soap residue, holding hands in upward position over sink
12. Dry the hands with a paper towel
13. Turn the faucet off with the used paper towel

### **Hand rubbing**

Use alcohol-based hand antiseptic rub for a minimum of **20-30 seconds**

1. Apply to dry, visibly clean hands
2. Rub hands vigorously to apply hand antiseptic to all surfaces of hands (as in steps 5 to 10 above)
3. Allow hands to dry

**NB:** USE ONLY SOAP AND WATER WHEN DEALING WITH SPORE-FORMING BACTERIA (e.g., *Clostridium difficile*) AND/OR WHEN YOUR HANDS ARE VISIBLY SOILED

## C. Agents used for HH

1. Water
  - a. Water is described as the universal solvent for a large number of substances
  - b. When used alone, water cannot remove dirt from hands
2. Drying Methods
  - a. Drying practice is a critical factor to determine the level of bacterial residue
  - b. Use paper towels
  - c. Pat the skin dry rather than rub it to avoid cracking (skin excoriation may lead to bacteria colonizing the skin)
  - d. Do not reuse or share hand drying towels

3. Plain (non-antimicrobial) soap
  - a. These soaps are detergent-based and will remove lipids and adhering dirt and organic matter
  - b. They have no antimicrobial activity
  - c. Such soaps can remove transient flora from the skin
4. Antimicrobial soap
  - a. These soaps are detergent-based and will remove lipids, adhering dirt and organic matter
  - b. They have antimicrobial activity
  - c. They can remove transient and resident flora from the skin
5. Alcohols
  - a. Alcohol-based hand antiseptics contain ethanol, isopropanol, n-propanol or a combination of two of these products
  - b. They have the ability to denature proteins
  - c. The most effective solutions contain 60%-80% alcohol (a higher concentration is less effective)
  - d. They are rapidly germicidal
  - e. Such antiseptics are available in gels, liquid, and foam

#### D. Care of hands

1. Use hand moisturizers to replace the oils lost by frequent hand hygiene procedures.
2. Ensure that the skin on your hands is intact. Cover non-intact skin areas with an occlusive dressing.
3. Do not use petroleum-based lotions, as they may interfere with glove integrity.

#### E. Medical assessment:

1. Any suspicion of a dermatological condition must be evaluated by an Employee Health Physician or the appropriate medical service.
2. HCWs that have exudative lesions or weeping dermatitis should refrain from all direct patient care and from handling patient care equipment until the condition resolves.

#### F. Use of gloves

1. The use of gloves does not replace the need for hand hygiene.
2. Wear gloves when it can be reasonably anticipated that contact with blood or other potentially infectious materials, mucous membranes, or non-intact skin will occur.
3. Remove gloves after any procedure with a patient.
4. Change or remove gloves during patient care if moving from a contaminated body site to either another body site (including non-intact skin, mucous membrane or a medical device) within the same patient or the environment.
5. Change gloves between patients.
6. Identify the correct type of glove to be used (Refer to Appendix 3).

#### G. Surgical hand hygiene (Refer to Appendix 4)

##### ***Before starting surgical hand hygiene preparation*** (hand scrub or hand rub)

1. Remove all jewelry and wristwatches before entering the operating room (OR) suite
2. Wash hands and arms up to the elbows with a non-medicated soap before entering the OR area.
3. Use a nail cleaner for the first surgical hand scrub of the day..

***Surgical hand scrub with antimicrobial soap***

1. Start timing and then scrub each side of each finger, between the fingers and the back and front of the hand for two minutes
2. Scrub the arms, keeping hands higher than the arms at all times
3. Wash each side of the arm from wrist to the elbow for one minute, repeating the process on the other hand and arm
4. Rinse hands and arms by passing them through the water in one direction (from fingertip to elbow), always keeping the hands above the elbows.
5. Proceed to the OR holding hands above the elbows.
6. Dry hands with a sterile towel and use aseptic technique to put on gloves.

**NB:** The duration of the procedure depends on the ingredients and the manufacturer's instructions (can range from 2-6 minutes).

***Surgical hand rub with alcohol-base preparation***

1. Start timing
2. Use sufficient product to keep hands and forearms wet with the hand rub throughout the procedure
3. See attachment for proper technique
4. After application of the product, allow hands and forearms to dry before donning sterile gloves
5. Proceed to the OR holding hands above the elbows.

**NB:** The duration of the procedure depends on the ingredients and the manufacturer's instructions (can range from 2-6 min) and should last until hands are dry.

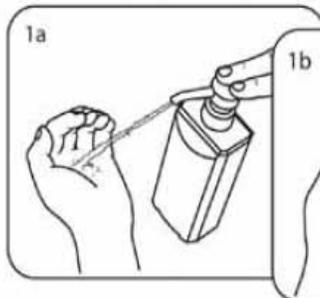
***Use of brushes***

Use of brushes is discouraged.

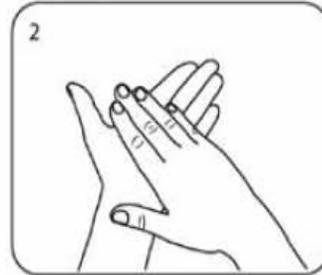
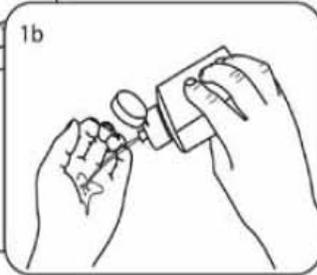
A disposable sponge or a combination of a sponge and brush has been shown to reduce bacterial counts on the hands.

## Appendix 1: Hand Hygiene Techniques

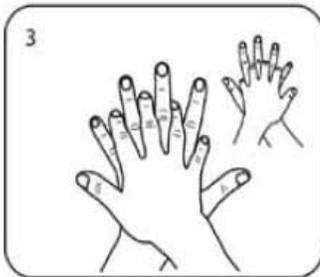
### Hand Hygiene Technique with Alcohol-Based Formulation



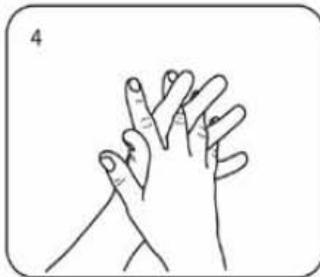
1a Apply a palmfull of the product in a cupped hand and cover all surfaces.



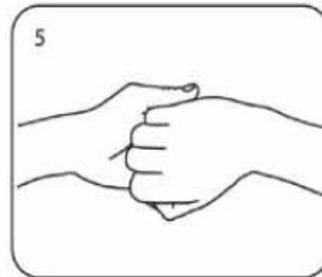
2 Rub hands palm to palm



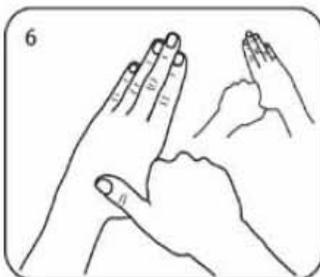
3 right palm over left dorsum with interlaced fingers and vice versa



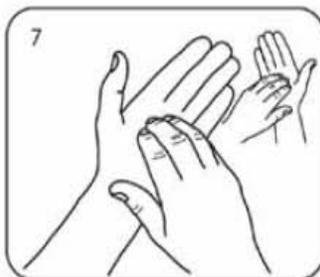
4 palm to palm with fingers interlaced



5 backs of fingers to opposing palms with fingers interlocked



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



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



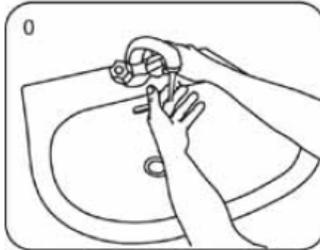
Duration of the entire procedure: 20-30 sec

...once dry, your hands are safe.

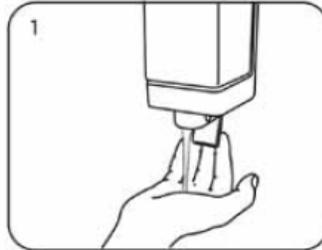
Modified according to EN1500

## Appendix 2: Handwashing Techniques

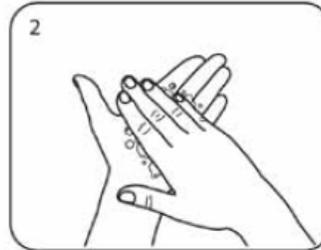
### Handwashing Technique with Soap and Water



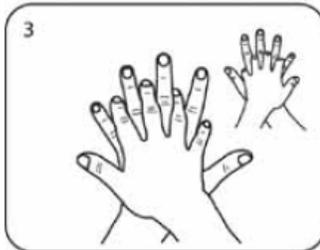
0 Wet hands with water



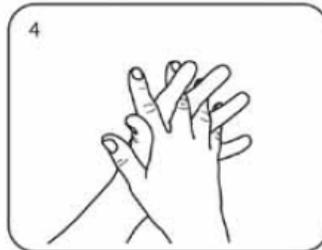
1 apply enough soap to cover all surfaces



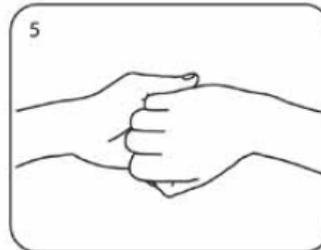
2 rub hands palm to palm



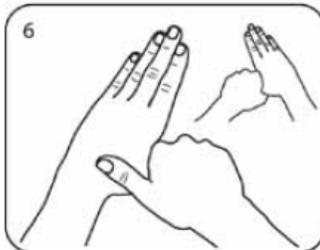
3 right palm over left dorsum with interlaced fingers and vice versa



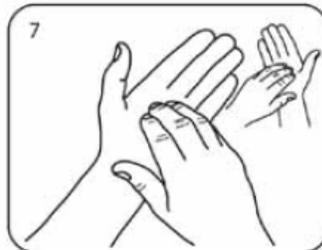
4 palm to palm with fingers interlaced



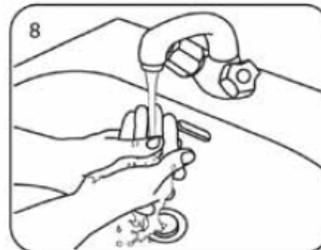
5 backs of fingers to opposing palms with fingers interlocked



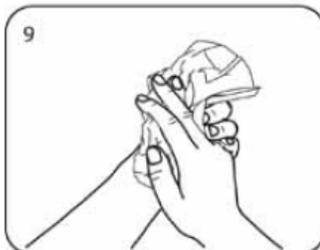
6 rotational rubbing of left thumb clasped in right palm and vice versa



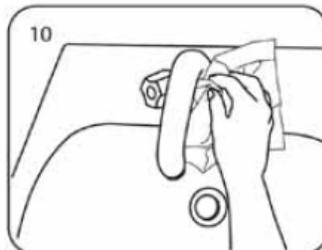
7 rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa



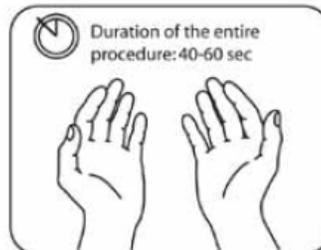
8 rinse hands with water



9 dry thoroughly with a single use towel



10 use towel to turn off faucet/tap

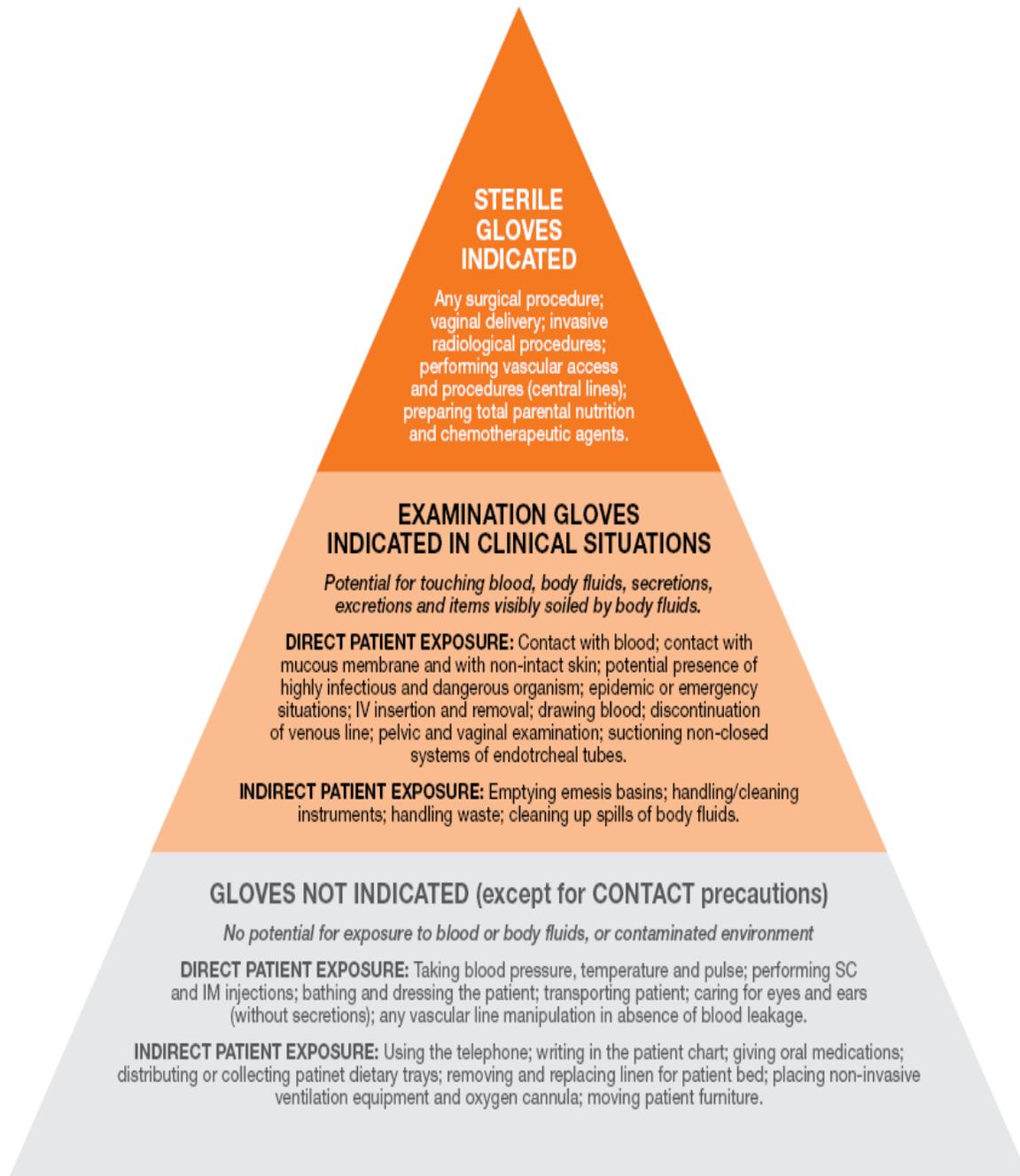


Duration of the entire procedure: 40-60 sec

...and your hands are safe.

Modified according to EN1500

## Appendix 3: Pyramid on Glove Use



## Appendix 4: Surgical Hand Hygiene

The handrubbing technique for surgical hand preparation must be performed on perfectly clean, dry hands. On arrival in the operating theatre and after having donned theatre clothing (cap/hat/bonnet and mask), hands must be washed with soap and water. After the operation when removing gloves, hands must be rubbed with an alcohol-based formulation or washed with soap and water if any residual talc or biological fluids are present (e.g. the glove is punctured).

Surgical procedures may be carried out one after the other without the need for handwashing, provided that the handrubbing technique for surgical hand preparation is followed (Images 1 to 17).



**1** Put approximately 5ml (3 doses) of alcohol-based handrub in the palm of your left hand, using the elbow of your other arm to operate the dispenser



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



**3** Images 3–7: Smear the handrub on the right forearm up to the elbow. Ensure that the whole skin area is covered by using circular movements around the forearm until the handrub has fully evaporated (10-15 seconds)



**4** See legend for Image 3



**5** See legend for Image 3



**6** See legend for Image 3



**7** See legend for Image 3



**8** Put approximately 5ml (3 doses) of alcohol-based handrub in the palm of your right hand, using the elbow of your other arm to operate the dispenser



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

## Appendix 4:...cont.



10

Smear the handrub on the left forearm up to the elbow. Ensure that the whole skin area is covered by using circular movements around the forearm until the handrub has fully evaporated (10-15 seconds)



11

Put approximately 5ml (3 doses) of alcohol-based handrub in the palm of your left hand, using the elbow of your other arm to operate the distributor. Rub both hands at the same time up to the wrists, and ensure that all the steps represented in Images 12-17 are followed (20-30 seconds)



12

Cover the whole surface of the hands up to the wrist with alcohol-based handrub, rubbing palm against palm with a rotating movement



13

Rub the back of the left hand, including the wrist, moving the right palm back and forth, and vice-versa



14

Rub palm against palm back and forth with fingers interlinked



15

Rub the back of the fingers by holding them in the palm of the other hand with a sideways back and forth movement



16

Rub the thumb of the left hand by rotating it in the clasped palm of the right hand and vice versa



17

When the hands are dry, sterile surgical clothing and gloves can be donned

Repeat the above-illustrated sequence (average duration, 60 sec) according to the number of times corresponding to the total duration recommended by the manufacturer for surgical hand preparation with an alcohol-based handrub.

TITLE/DESCRIPTION: <b>ASEPTIC TECHNIQUES</b>		INDEX NUMBER: <b>ICM – II-05</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines on practices to reduce the number of microorganisms on hands, supplies and equipment during patient care procedures.

## REFERENCE

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 19: Hand Hygiene. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 20: Aseptic Technique. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)

## COMMENTS

1. The degree of risk for infection associated with the procedures in question will help determine the technique to adopt.
2. **Aseptic technique** refers to practices designed to render and maintain objects and areas maximally free of microorganisms. This may consist of aid in the prevention of surgical site, urinary tract, bloodstream, and pneumonia infections that may be device or procedure related.
3. **Clean technique (medical asepsis)** refers to practices that reduce the number of microorganisms or prevent/reduce transmission from one person (or place) to another.
4. **Sterile technique (surgical asepsis)** refers to practices that provide the maximum reduction of skin microorganisms without damaging tissues. It involves the use of barrier techniques to decrease the transmission of microorganisms from personnel to patients.
5. Both sterile and clean techniques are elements of this infection method, although both have distinct similarities and differences.

## PROCEDURE

### A. Clean technique (medical asepsis)

1. Use clean techniques for routine patient care procedures.
2. Prepare and organize equipment and supplies.
3. Reduce the number of skin microorganisms by adhering to proper hand hygiene practices.
4. Use clean or sterile single-use patient devices and equipment if available, or use reusable devices and equipment that have been properly cleaned and reprocessed.
5. Select an appropriate site on patient (isolate the area)
  - a. Prepare the patient's skin before the procedure by applying the hospital-approved antiseptic agent to the patient's clean skin
  - b. Use correct skin prep for the patient's body site

- c. Clean from the area that is clean to the area that is dirty
- d. Remove hair only when necessary; do so immediately before the procedure using clippers and NOT razors
6. Use barrier techniques to reduce microbial transmission from patient to personnel.
  - a. Use a “no-touch” dressing technique to avoid the contamination of sterile supplies. Use sterile gloves or forceps for the application of dressings.
  - b. Wear a clean gown/apron to minimize the contamination of clothing.
  - c. Wear clean gloves to avoid direct contact with infectious materials.
7. Provide environmental controls to reduce microbial transmission.
  - a. Use negative-pressure rooms for patients with infectious agents that can be spread by airborne route.
  - b. Change the covers/sheets used on examination table, stretchers, or wheelchairs) between patients.

### **B. Sterile technique (surgical asepsis)**

1. Use sterile techniques for all invasive procedures.
2. Reduce the number of skin microorganisms by adhering to proper hand hygiene practices.
3. Decontaminate your hands using an antiseptic hand rub (chlorhexidine/alcohol-based product) or antiseptic soap before putting on sterile gloves.
4. Prepare and organize equipment and supplies.
5. Use sterile, single-use patient devices and equipment.
6. Select the appropriate site on the patient (isolate the area)
  - a. Prepare the patient’s skin before the procedure by applying the hospital-approved antiseptic agent to the patient’s clean skin
  - b. Use the correct skin prep for the patient’s body site
  - c. Clean from the area that is cleanest to the area that is dirty
  - d. Remove hair only when necessary; do so immediately before the procedure using clippers and NOT razors
7. Use barriers to decrease the transmission of microorganisms from personnel to the patient.
  - a. Mask, sterile gown and gloves, head cover, and large sterile surgical drape on the patient should be used.
  - b. Put on appropriate sterile apparel as required by risk of procedure to be performed.
  - c. Maintain an area of sterility with the use of sterile supplies (e.g., gloves, drapes, and other equipment).
8. Provide environmental controls to maximize the reduction of microorganisms during procedure.
  - a. Use special treatment rooms when indicated (e.g., in the OR or radiology).
  - b. Maintain positive pressure in the room.

**NB:** Use negative-pressure rooms for patients with infectious agents spread by the airborne route. Provide a higher rate of air exchanges through the ventilation system.

- c. Exclude visitors and unnecessary personnel.
- d. Keep doors closed during procedures or use other physical barriers such as screens to divert traffic.
- e. Avoid cleaning/maintenance activities in the area during the procedure.

**C. Maintain asepsis**

1. It is important to be fully prepared before starting any procedure.
2. Anticipate what is needed for the procedure.
3. Supplies required may include but are not limited to the following:
  - a. Clean trolley (tray)
  - b. Supplies (PPE, gauze, site prepping solutions)
  - c. Equipment (proper pack, size, type, amount)
  - d. Accessible disposal unit
  - e. Help (if required)
4. Avoid leaving the room/bedside to get supplies.
5. Follow the approved policy for the procedure being performed.
6. Change gloves (after removing old dressing and before applying clean dressing).

**D. Other recommendations to maintain asepsis**

1. Clean and disinfect environmental surfaces routinely after each procedure.
  - a. Use clean equipment and supplies (mops, water, cleaning cloths).
  - b. Use detergent to remove soil.
2. Clean up body fluid spillage using hospital-approved disinfectant.
3. Dispose of all contaminated materials and supplies appropriately to avoid contaminating HCWs, patients and environmental surfaces.
4. Reprocessing of reusable equipment and surgical instruments must be done by the designated department.
5. Use special equipment for ventilation (e.g., high-efficiency particulate air filters or laminar air flow) when feasible.

**Table 1: Recommendations for HCWs regarding hand and skin preparation of patient skin (site) ONLY**

Procedure	Example	Hand hygiene	Gloves	Preparation of patient's skin	Comment
<b>A. Medical Asepsis (Clean Procedures)</b>					
Procedures in which instruments come in contact with intact mucous membranes	1. Bronchoscopy, gastrointestinal endoscopy, tracheal suction	Antibacterial soap and water or alcohol-based hand rub**	Clean	None is required	
	2. Peripheral Intravenous insertion	Antibacterial soap and water or alcohol hand rub**	Clean	0.05% chlorhexidine solution* can be used to prepare the urethral meatus	DO NOT use alcohol-containing antiseptic
<b>B. Surgical Asepsis (Sterile Procedures)</b>					
Procedures in which instruments go through sterile tissue or fluid	1. Urinary tract catheterization 2. Arterial line insertion	Antibacterial soap and water or alcohol hand rub**	Sterile	Hospital-approved antiseptics* should be used.  Select appropriately for the patient's site.	Most epidemics of infection associated with arterial pressure monitoring devices appear to be caused by hospital-associated contamination of components external to the skin, such as transducer heads or domes; "endemic" IV-related bloodstream infections are frequently associated with skin flora
	3. Central Venous Line (CVL) insertion - CVL wire insertion - Cardiac pacemaker insertion	Antibacterial soap and water or alcohol hand rub**	Sterile	Hospital-approved antiseptics* should be used.	"Defatting" agents do not appear to decrease infections and can cause skin irritation

\*Antiseptics available are:

1. 2% aqueous chlorhexidine gluconate swabs (neonates <2 wk and <1500 grams)
2. 2% chlorhexidine in 70% alcohol swabs
3. 0.05% chlorhexidine aqueous solution (pink in color, for perineum care)
4. 10% povidone iodine (swabs or liquid)
5. 70% alcohol (swabs or liquid)

\*\*Hand preparations available are:

1. Antibacterial soap
2. 62%-70% alcohol-based hand rub
3. 2% chlorhexidine in 70% alcohol surgical hand scrub (according to the manufacturer's recommendations)

Cont...Table 1: Recommendations for HCWs regarding hand and skin preparation of patient skin (site) ONLY

Procedure	Example	Hand hygiene	Gloves	Preparation of patient's skin	Comment
	4. Spinal tap Thoracentesis Abdominal paracentesis	Antibacterial soap and water or alcohol hand rub**	Sterile	Hospital-approved antiseptics* should be used	
	5. Cystoscopy	Antibacterial soap and water or alcohol hand rub**	Sterile	Povidone iodine or 0.05% chlorhexidine solution* can be used to prepare the urethral meatus	DO NOT use alcohol-containing antiseptic
	6. Chest tube insertion Colposcopy Laparoscopy Peritoneal catheter insertion	Surgical hand scrub (2-3 min) with antibacterial soap and water or Alcohol surgical hand scrub**	Sterile	Hospital-approved antiseptics* should be used  If hair removal is considered necessary, clippers should be used immediately before the procedure	
II. Minor skin surgery	1. Skin biopsy, suturing of small cuts, lancing boils and mole removal  2. Circumcision	Surgical hand scrub (2-3 min) with antibacterial soap and water or Alcohol surgical hand scrub**	Sterile	Hospital-approved antiseptics* should be used	
III. Other procedures (major and minor surgery) that enter tissue below the skin	1. Hysterectomy Cholecystectomy Herniorrhaphy	Surgical hand scrub (2-3 min) with antibacterial soap and water or Alcohol surgical hand scrub**	Sterile	Antiseptic* should be used after the site has been scrubbed with detergent  If hair removal is considered necessary, clippers should be used immediately before the procedure	Hand disinfection before surgical procedures that enter deep tissue is usually prolonged to ensure that all areas that harbor bacteria are adequately cleaned.

\*Antiseptics available are:

1. 2% aqueous chlorhexidine gluconate swabs (neonates <2 wk and <1500 grams)
2. 2% chlorhexidine in 70% alcohol swabs
3. 0.05% chlorhexidine aqueous solution (pink in color, for perineum care)
4. 10% povidone iodine (swabs or liquid)
5. 70% alcohol (swabs or liquid)

\*\*Hand preparations available are:

1. Antibacterial soap
2. 62%-70% alcohol-based hand rub
3. 2% chlorhexidine in 70% alcohol surgical hand scrub (according to the manufacturer's recommendations)

TITLE/DESCRIPTION: <b>THERAPEUTIC PROCEDURES</b>		INDEX NUMBER: <b>ICM – II-06</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

Procedures or any therapy that bypass the body's normal defense mechanisms can allow bacteria to gain access to tissues and organs that are normally sterile. Such access sometimes results in infection.

## EQUIPMENT / MATERIAL

Nursing policies and procedure on:

- Management of patients with urinary catheterization
- Management of patients with intravascular devices
- Management of patients with tracheostomy
- Management of patients with cardiopulmonary ventilation
- Others as existing

## COMMENTS

Specific instructions for carrying out therapeutic procedures will be outlined in the Nursing Policy and Procedure Manual.

To eliminate any duplication the policies described above and any other existing policies and procedures that have infection control implications will be reviewed in collaboration with the Nursing Practice Council.

## PROCEDURE

See specific policy and procedure in related Nursing Policy and Procedure Manual.



## Section 3: ISOLATION PROCEDURES

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TITLE/DESCRIPTION: <b>EPIDEMIOLOGY OF INFECTION</b>		INDEX NUMBER: <b>ICM – III-01</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

The purpose of this policy is to provide information about the epidemiological principles and methods used to describe how microorganisms are transmitted and how to reduce or prevent disease transmission.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 2: General principles of epidemiology. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18: Research and study design. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
3. HICPAC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare settings, 2007.

## COMMENTS

1. The spread of infection within the hospital requires three essential elements: a source of infectious agents, a susceptible host and a mode of transmission. Each element can be equated to a link in a chain.
2. This chain analogy is used to represent the series of interactions that are necessary to produce an infection process. To prevent the transmission of infectious agents, it is important to understand the role that each element (link) plays.
3. Healthcare workers are encouraged to become familiar with this concept to develop and expand a knowledge base for interpreting data gathered within and outside the healthcare facility, for understanding the associations between risk factors and infection in different settings and for appreciating how these findings can be used to reduce infection risks.
4. **Endemic** refers to the usual incidence of a given disease within a geographical area during a specified time period.
5. **Epidemic** refers to a greater incidence of disease over the expected incidence of the disease within a given geographical area during a specified time period.
6. **Pandemic** refers to an epidemic spread over a wide geographical area, across countries or continents.
7. **Reservoir** refers to a place in where an infectious agent can survive but may or may not multiply.
8. **Infection** refers to the entry into and multiplication of an infectious agent in the tissues of the host and the tissue damage resulting in apparent or unapparent changes in the host.
9. **Healthcare-associated infections** (HAIs) are infections that were not present or incubating at the time of admission to the hospital but are temporally associated with admission to or a procedure performed in a healthcare facility.
10. **Colonization** refers to the presence of microorganisms in or on a host with growth and multiplication but without tissue invasion or damage.

## PROCEDURE

Understanding the Chain of Infection must precede the breaking of its links, which leads to the prevention of infection.

- A.** Each of the 6 components (or links) in this chain is required to cause colonization or infection:
1. The *causative agent* is a biological, physical, or chemical entity capable of causing disease.
  2. The *reservoir* is a place in which an infectious agent can survive but may or may not multiply.
    - a. The source of the infectious agent may be patients, personnel, or visitors and may include persons with active infection, persons in the incubation period of the disease, or persons who are colonized by the infectious agent but have no apparent disease.
    - b. Other sources of infection include inanimate objects in the environment, such as equipment and medications that have become contaminated.
  3. The *portal of exit* is the path by which an infectious agent leaves the reservoir.
  4. The *mode of transmission* is the method by which the organism reaches a susceptible host; three modes of transmission are of particular importance in the healthcare setting:
    - a. **Contact Transmission** is the most important and frequent mode of transmission in nosocomial infections. This transmission type is further divided into two sub-groups:
      - i. **Direct Contact:** involves direct physical contact between a susceptible host and an infected or colonized person, e.g., nurse-patient contact during routine care, patient-patient contact or patient-visitor contact. Such contact can cause direct transfer of microorganisms from one person to another.
      - ii. **Indirect Contact:** involves the physical contact of a susceptible host with a contaminated intermediate object such as bed linen, instruments, dressings, shared equipment or healthcare environmental surfaces.
    - b. **Droplet Contact** involves the transmission of microorganisms in droplets generated from an infected or colonized person during talking, sneezing or coughing or generated during certain procedures such as suctioning and bronchoscopy. Microorganisms are aerosolized and deposited on the host's conjunctiva, nasal mucosa and/or mouth.
    - c. **Airborne Transmission** involves the dissemination of droplet nuclei or dust particles containing the infectious agent in the air. Organisms carried in this manner can be widely dispersed by air currents before being inhaled.
  5. The *portal of entry* is the means by which an infectious agent enters the susceptible host.
  6. Although everyone is a *susceptible host* at some level, the elderly, the young, and those with decreased stomach acid are especially vulnerable.
    - a. A patient's resistance to pathogenic agents varies greatly. Systemic disease, age (especially extremely young or old age), trauma, surgical procedures, and radiological, drug treatments and indwelling devices can decrease resistance and make patients more susceptible to infection.

**B. Prevention of disease transmission**

Prevention of the transmission of an infectious agent is the responsibility of all staff:

1. Treat all bodily fluids as potentially infectious
2. Dispose of waste according to hospital policy (refer to policy [ICM-IX-02 Waste Management](#))
3. Adhere to aseptic technique when required (refer to policy [ICM-II-05 Aseptic Technique](#))
4. Adhere to hand hygiene practices (refer to policy [ICM-II-04 Hand Hygiene](#))
5. Maintain good personal hygiene
6. Adhere to the hospital policy for managing isolated patients (refer to policy [ICM-III-02 Isolation Precautions](#))
7. Observe effective housekeeping practices
8. Adhere to STANDARD PRECAUTIONS (refer to policy [ICM-II-03 Standard Precautions](#))
9. Store foods and personal belongings appropriately in the workplace

TITLE/DESCRIPTION: <b>ISOLATION (EXPANDED) PRECAUTIONS</b>		INDEX NUMBER: <b>ICM – III-02</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To describe the principles of isolation precautions (also known as expanded precautions) needed to further reduce or prevent the spread of epidemiologically significant or highly transmissible pathogens when standard precautions alone are insufficient.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18: Isolation precautions – recommendation for isolation precautions in hospitals. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. HICPAC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare settings, 2007.

## COMMENTS

1. **Isolation precautions** contain two tiers: Standard Precautions and Transmission-based Precautions.

STANDARD PRECAUTIONS	TRANSMISSION-BASED PRECAUTIONS
Apply to all patients in all situations.	Apply in addition to Standard Precautions to patients known or suspected of being infected or colonized with an epidemiologically important or highly transmissible pathogen.

- a. **Standard precautions** are designed to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection in hospitals. Standard precautions apply to blood, all body fluids (secretions and excretions except sweat regardless of whether they contain blood), non-intact skin and mucous membranes. Refer to policy [ICM-II-03](#) *Standard Precautions*.
- b. **Transmission-based precautions** is designed for patients documented to be or suspected to be infected or colonized with highly transmissible or epidemiologically important pathogens for which additional precautions beyond Standard Precautions are required.
  - i. There are three types of isolation precautions: Airborne, Droplet and Contact Precautions.
  - ii. These precautions may be combined for diseases that have multiple routes of transmission. When used either singularly or in combination, they are to be used in addition to Standard Precautions.
  - iii. Refer to policy [ICM-III-06](#) *Isolation System: A Quick Reference Guide to Pathogen/Isolation Requirements*.
- c. Protective environment guidelines refer to policy [ICM-VII-05](#) *Immunocompromised Patient*.

## PROCEDURE

Nurses will take the following steps:

1. Initiate isolation precautions as specified and/or based on clinical assessment of the patient in consultation with the attending physician and/or infection control practitioner (ICP). (Microbiology reports may or may not support the clinical assessment.)
2. Arrange for the required isolation supplies for the room; place the appropriate isolation precautions sign on the room door and on the patient's Kardex.
3. Give the necessary instructions to patients and visitors.

TITLE/DESCRIPTION: <b>CONTACT ISOLATION PRECAUTIONS</b>		INDEX NUMBER: <b>ICM – III-03</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

In addition to standard precautions, Contact Isolation Precautions is intended to reduce the risk of transmission of epidemiologically important microorganisms by the direct or indirect contact with the patients or the patients' environment.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18-III: Isolation precautions – recommendations for isolation precautions in hospitals. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. HICPAC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare settings, 2007

## COMMENTS

1. Contact isolation precautions must be used together with Standard Precautions ([ICM-II-03](#)).
2. Contact precautions also apply when the presence of excessive wound drainage, fecal incontinence or other discharges from the body suggest an increased potential for extensive environmental contaminations and risk of transmission.
3. Patients diagnosed with the same disease can be placed in the same room (cohorted), assuming that no other infection is present.

## PROCEDURE

1. Contact isolation should be initiated and maintained when there is a suspected or confirmed diagnosis of an infectious disease that is transmitted by the contact route. Refer to policy [ICM-III-06](#) *Isolation System: A Quick Reference Guide*.
2. The patient should be in a single room. A neutral pressure room is indicated.
  - a. Put a contact isolation sign on the door.
  - b. Keep the door closed.
3. All healthcare workers must wear the appropriate PPE (gown and gloves) when anticipating contact with patient or the patient's environment.
  - a. Change the gown and gloves between patients even if both patients share a room and both are under Contact Precautions.
4. Notify Infection control practitioner that the patient is placed in contact isolation.
5. The "5 Moments of Hand hygiene" must be followed by all personnel entering and leaving the patient care area.

6. Explain the purpose of precautions to the patient and visitors to encourage their cooperation with hand hygiene.
7. Limit patient transport outside the room to medically necessary purposes (if the patient is to be transported, refer to policy [ICM-III-09](#) *Transporting Patients on Isolation Precautions*).
  - a. Inform the destination department/facility of the patient's isolation status during transport.
8. Environmental measures: Housekeepers should wear gowns and gloves before room entry to clean the patient's room, and gowns and gloves should be discarded when leaving.
9. Discontinue isolation precautions in consultation with infection control.

TITLE/DESCRIPTION: <b>DROPLET ISOLATION PRECAUTIONS</b>		INDEX NUMBER: <b>ICM – III-04</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

In addition to standard precautions, Droplet Isolation Precautions prevents the transmission of infectious agents that are spread through close respiratory or mucous membrane contact with respiratory secretions.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18-III: Isolation precautions – recommendations for isolation precautions in hospitals. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. HICPAC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare settings, 2007.

## COMMENTS

1. Droplet Isolation Precautions must be used together with Standard Precautions ([ICM-II-03](#)).
2. Droplet Precautions are intended to reduce the risk of droplet transmission of infectious agents from close contact (exposure to eyes, nose and mouth) with large-particle droplets (larger than 5 µm) generated by coughing, sneezing, talking or aerosol-generating procedures.
3. Patients diagnosed with the same disease can be placed in the same room (cohorted) assuming that no other infection is present.

## PROCEDURE

1. Initiate and maintain droplet precautions when there is suspected or confirmed diagnosis of an infectious disease that is transmitted by the droplet route.
2. Use a single room. A negative air pressure room is not indicated.
  - a. Place a droplet sign on the door.
3. Notify the Infection Control Practitioner that the patient is placed under precautions.
4. Wear appropriate PPE (surgical mask, gloves, and gown) as needed.
  - a. A surgical mask is required within 3 feet of the patient.
5. The “5 moments of hand hygiene” must be followed by all personnel entering and leaving the patient care area.
6. Encourage the patient to observe basic personal hygiene (hand hygiene, care with secretions).
7. Keep the patient in the room for the duration of the infectious period if possible. Limit patient transport to essential medical purposes (if patient is to be transported, refer to policy [ICM-III-09](#) *Transporting Patients on Isolation Precautions*).
  - a. Place a surgical mask on the patient if he/she must leave the room.
  - b. Inform the destination department/facility regarding droplet precautions when the patient is being transported.
8. Explain the purpose of the precautions to the patient and visitors to encourage their cooperation.

9. Environmental Measures: Daily cleaning of the high touch surfaces with hospital-approved disinfectant is appropriate. Housekeeping staff should wear a surgical mask before entering the room.
10. Discontinue isolation precautions in consultation with infection control. Refer to policy [ICM-III-06](#) *Isolation System: A Quick Reference Guide*.

TITLE/DESCRIPTION: <b>AIRBORNE ISOLATION PRECAUTIONS</b>		INDEX NUMBER: <b>ICM – III-05</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

In addition to standard precautions, Airborne Isolation Precautions prevents the transmission of infectious agents that remain infectious over long distances when suspended in the air (measles, varicella, pulmonary tuberculosis, avian influenza, severe acute respiratory syndrome {SARS}).

## REFERENCES

1. American Thoracic Society. (1992). Control of tuberculosis in the United States. 146; 1623-1633
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18: Isolation Precautions. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
3. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 91: Mycobacteria. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
4. Centers for Disease Control and Prevention (CDC). Guidelines for preventing the transmission of mycobacterium tuberculosis in healthcare settings *MMWR*. 2005
5. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007

## COMMENTS

1. Airborne isolation precautions must be used together with Standard Precautions ([ICM-II-03](#)).
2. Airborne isolation is used when a patient is suspected or confirmed to have any of the diseases that are spread via the airborne route.
3. Healthcare workers (HCWs) are expected to be immune to vaccine-preventable diseases such as measles and varicella that are transmitted via the airborne route.
4. Non-immune HCWs must not take care of a patient in isolation.
5. Rooms with negative air pressure system (also called airborne infectious isolation rooms (AIIRs)) are vital to prevent the risk of infectious particles escaping and potential exposure/transmission of disease.
6. A fit-tested respirator particulate mask (N95 or higher) is required for respiratory protection for HCWs. These masks prevent the risk of disease transmission through inhalation.

## PROCEDURE

1. Initiate and maintain isolation when there is suspicion or confirmed diagnosis of an infectious disease that is transmitted by the airborne route.
2. Use a single room with a negative air pressure system (AIIR)
  - a. Put the Airborne Isolation sign on the door.
  - b. Keep door closed at all times except when entering or leaving the room.

3. HCWs must wear an N95 mask/respirator before entering the room when a patient has suspected or confirmed pulmonary MTB and remove the mask when outside the room.
4. Notify the Infection Control Practitioner that the patient is in isolation.
5. The “5 Moments of Hand Hygiene” must be followed by all personnel entering and leaving the patient care area.
6. Keep the patient in the room during the infectious period (if patient is to be transported, refer to policy [ICM-III-09](#) *Transporting Patients on Isolation Precautions*).
  - a. Place a surgical mask on the patient if he/she must leave the room.
  - b. Instruct patient on respiratory hygiene and cough etiquette.
  - c. Cover all lesions.
  - d. Limit the transport of patients to essential medical purposes.
7. Instruct patients on respiratory hygiene and cough etiquette.
8. Check with visitors and staff for their immune status to the disease and instruct them regarding the use of protective apparel and conduct in the isolation room.
  - a. Emphasize proper personal hygiene and hand hygiene.
9. Notify other departments that will be receiving the patient of his/her isolation status.
10. Environmental measures: Routine cleaning of high touch surfaces is standard. Housekeeping personnel should wear the N95 mask upon room entry.
11. In settings where airborne precautions cannot be implemented immediately, do the following:
  - a. Place a surgical mask on the patient.
  - b. Place the patient in a single room with a door. Keep the door closed.
  - c. Provide N95 masks for HCWs entering the patient’s room.
  - d. Arrange for the patient to be transferred to an airborne isolation room and/or to be discharged as soon as possible.
12. Discontinue isolation precautions in consultation with infection control. Refer to policy [ICM– III-06](#) *Isolation System: A Quick Reference Guide*.
13. In case of negative pressure system failure, refer to policy [ICM-III-11](#) *Negative Pressure Room Monitoring*.

TITLE/DESCRIPTION: <b>ISOLATION SYSTEM: A QUICK REFERENCE GUIDE</b>		INDEX NUMBER: <b>ICM – III-06</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

This policy provides a quick reference guide for the selection of the appropriate isolation precaution(s). Each disease and condition is considered individually; only those precautions that are indicated to interrupt transmission for the disease/condition in question are recommended.

## COMMENTS

1. Standard Precautions are those designed for the care of all patients in the hospital regardless of their diagnosis or presumed infection status. Implementation of Standard Precautions is the primary strategy for successful nosocomial prevention and control.
2. Isolation (transmission based) Precautions are designed for patients who are known or suspected to be infected with epidemiologically important pathogens that can be spread by the airborne, droplet, or contact routes.

Key	
1. C	Contact isolation
2. CN	Culture negative (with specified amount)
3. D	Droplet precautions
4. DE	Decontamination of environment
5. DH	Duration of hospitalization
6. DI	Duration of illness
7. LC	Lesions crusted
8. A	Airborne precautions
9. S	Standard precautions
10. SAPP	Special Administrative Policy and Procedure
11. U	Time (in hours or days) after the initiation of effective antimicrobial therapy
12. U <sup>R</sup>	Time (in days) after onset of rash
13. U <sup>S</sup>	Time (in days) after onset of swelling

## PROCEDURE

Refer to [Appendix 1 – III-06](#) *Isolation Systems: A Quick Reference Guide*

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
<b>Abscess</b>		
• Draining, major	S, C	DI
• Draining, minor or limited	S	
<b>Acquired immunodeficiency syndrome (AIDS)</b>	S	
<b>Actinomycosis</b>	S	
<b>Adenovirus infection</b>		
• Conjunctivitis	S, C	DI
• Disseminated (2 or more sites) infection in immuno-compromised host	S, C	DI
• Gastroenteritis	S, C	DI
• Respiratory infection	S, D	DI
<b>Amoebiasis</b>	S	
<b>Anthrax</b>		
• Environmental aerosolizable spore-containing powder	S, C	DE*
• Cutaneous	S, C	
• Pulmonary	S, C	
<b>Antibiotic-associated colitis</b> (see <i>Clostridium difficile</i> )	–	–
Arthropod-borne viral encephalitis (Eastern, Western and Venezuelan equine encephalomyelitis; St. Louis or California encephalitis, West Nile Virus, dengue, yellow fever)	S	
<b>Ascariasis</b>	S	
<b>Aspergillosis</b>	S	
<b>Avian influenza A</b> (H5N1 Virus) <b>Avian influenza A</b> (H1N1 Virus)	S, D, C	14 days after onset of symptoms
<b>Babesiosis</b>	S	
<b>Blastomycosis</b> (North American - cutaneous or pulmonary)	S	
<b>Botulism</b>	S	

\* Persons decontaminating the area must wear N95 mask and protective clothing

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
<b>Bronchiolitis</b> (see respiratory infection in infants and young children)	S	
<b>Brucellosis</b> (undulant, Malta, Mediterranean fever)	S	
<b>Cat-scratch fever</b> (benign inoculation lymphoreticulosis)	S	
<b>Cellulitis</b> (uncontrolled drainage)	S, C	DI
<b>Chancroid</b> (soft chancre)	S	
<b>Chickenpox</b> (varicella)	S, A, C	DI/LC
<i>Chlamydia trachomatis</i>		
• Conjunctivitis	S	
• Genital (lymphogranuloma venerum)	S	
• Pneumonia (infants ≤3 months old)	S	
<b>Cholera</b> (see gastroenteritis)	C	
<b>Closed-cavity infection</b>		
• Draining (limited or minor) and not draining	S	
• Copious, uncontrolled drainage	S, C	
<b>Clostridium</b>		
• <i>C. botulinum</i>	S	
• <i>C. difficile</i>	S, C	U <sup>48hrs</sup> after diarrhea stops
• <i>C. perfringens</i>		
▪ Food poisoning	S	
▪ Gas gangrene	S	
<b>Coccidioidomycosis</b> (valley fever)		
• Draining lesions	S	
• Pneumonia	S	
<b>Colorado tick fever</b>	S	

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
<b>Congenital rubella</b>	S, C	Until 1 yr of age
<b>Conjunctivitis</b>		
• Acute bacterial	S	
• Chlamydia	S	
• Gonococcal	S	
• Acute viral (acute hemorrhagic)	S, C	DI
<b>Corona virus associated with SARS</b> (see SARS)		
<b>Coxsackie virus disease</b> (see enteroviral infection)		
<b>Creutzfeldt-Jakob disease</b> (CJD, VCJD)	S	
<b>Crimean-Congo fever virus</b>	S, C, D	DI
<b>Croup</b> (see respiratory infections in infants and young children)		
<b>Cryptococcosis</b>	S	
<b>Cryptosporidiosis</b> (see gastroenteritis)		
<b>Cysticercosis</b>	S	
<b>Cytomegalovirus infection</b> (neonatal or immuno-suppressed)	S	
<b>Decubitus ulcer</b> (infected)		
• Major	S, C	DI
• Minor or limited	S	
<b>Dengue fever</b>	S	
<b>Diarrhea</b> (acute infective etiology suspected; see gastroenteritis)		
<b>Diphtheria</b>		
• Cutaneous	S, C	CNx2*
• Pharyngeal	S, D	CNx2*
<b>Ebola viral hemorrhagic fever</b>	S, C, D	DI/SAPP

\*cultures must be taken 2 hours apart

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
<b>Echinococcosis</b> (hydatidosis)	S	
<b>Echovirus</b> (see enteroviral infection)		
<b>Encephalitis or encephalomyelitis</b> (see specific etiologic agents)		
<b>Endometritis</b>	S	
<b>Enterobiasis</b> (pinworm disease, oxyuriasis)	S	
<b>Enterococcus spp.</b> (see multidrug-resistant organisms if epidemiologically significant or vancomycin resistant)		
<b>Enterocolitis: <i>Clostridium difficile</i></b>	S, C	DI
<b>Enteroviral infections</b> (group A & B coxsackie and echo viruses-excluding polio virus)		
• Adults	S	
• Infants and young children	S, C	DI
<b>Epiglottitis</b> , due to <i>Haemophilus influenzae type b</i>	S, D	U <sup>24Hrs</sup>
<b>Epstein-Barr virus infection</b> , including infectious mononucleosis	S	
<b>Erythema infectiosum</b> (also see parvovirus B19)	D	
<b><i>Escherichia coli</i> gastroenteritis</b> (see gastroenteritis)		
<b>Food poisoning</b>		
• Botulism	S	
• <i>Clostridium perfringens</i> or <i>Clostridium welchii</i>	S	
• Staphylococcal	S	
<b>Furunculosis, staphylococcal</b>		
• Infants and young children	S, C	DI
<b>Gangrene (gas gangrene)</b>	S	
<b>Gastroenteritis *</b>	S, C (Diapered or incontinent)	DI

\*cultures must be taken 2 hours apart

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
• Adenovirus	S	
• <i>Campylobacter</i> spp.	S	
• Cholera	S, C	DI
• <i>Clostridium difficile</i> (see <i>C. difficile</i> )	S, C	U <sup>48hrs</sup> after diarrhea stops
• <i>Cryptosporidium</i> spp.*	S	
• <i>Escherichia coli</i>		
▪ Enterohemorrhagic 0157:H7 <i>E. coli</i>	S	
▪ Other species	S	
• <i>Giardia lamblia</i>	S	DI
• Noroviruses	S	
• Rotavirus	S, C	DI
• <i>Salmonella</i> spp. (including <i>S. typhi</i> )	S	
• <i>Shigella</i> spp.	S	
▪ Diapered or incontinent	S, C	DI
• <i>Vibrio parahaemolyticus</i>	S	
• Viral (if not covered elsewhere)	S	
• <i>Yersinia enterocolitica</i>	S	
<b>German measles</b> (rubella)	S, D	U <sup>R</sup> x7
<b>Giardiasis</b> (see gastroenteritis)		
<b>Gonococcal ophthalmia neonatorum</b> (gonorrheal ophthalmia, acute conjunctivitis of newborns)	S	
<b>Gonorrhea</b>	S	
<b>Granuloma inguinale</b> (donovanosis granuloma)	S	
<b>Gillian-Barre syndrome</b>	S	
<b>Hand, foot, and mouth disease</b> (see enteroviral infection)		
<b>Hantavirus pulmonary syndrome</b>	S	

\*cultures must be taken 2 hours apart

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
<b>Helicobacter pylori</b>	S	
<b>Hepatitis, viral</b>		
• Type A	S	
▪ Diapered or incontinent patients	S, C	
• Type B, HBsAg positive, acute or chronic	S	
• Type C and other unspecified non-A, non-B	S	
• Type E	S	
<b>Herpangina</b> (see enteroviral infection)		
<b>Herpes simplex</b> (Herpesvirus hominis)		
• Encephalitis	S	
• Neonatal	S, C	DI
• Mucocutaneous, disseminated or primary, severe	S, C	DI
• Mucocutaneous, recurrent (skin, oral, genital)	S	
<b>Herpes zoster</b> (varicella-zoster)*		
• Disseminated in any patient	S, A, C	
• Localized in immuno-compromised patient	S, A, C	DI/LC
• Localized in normal patient	S	DI
<b>Histoplasmosis</b>	S	
<b>Hookworm disease</b> (ancylostomiasis, uncinariasis)	S	
<b>Human immunodeficiency virus (HIV) infection</b>	S	
<b>Impetigo</b>	S, C	U <sup>24Hrs</sup>
<b>Infectious mononucleosis</b>	S	
<b>Influenza</b>	S, D	5 days
• In immunocompromised patient	S, D	DI

\* Persons susceptible to varicella are also at risk upon exposure to zoster patients. Non-immune staff should not enter the room of a chickenpox patient or a zoster patient.

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
<b>Influenza (avian)**</b>	S, A, C	DI
<b>Kawasaki syndrome</b>	S	
<b>Lassa fever</b>	S, A, C	DI
<b>Legionnaires' disease</b>	S	DI/SAPP
<b>Leprosy</b>	S	
<b>Leptospirosis</b>	S	
<b>Lice (pediculosis)</b>	S, C	U <sup>24Hrs</sup>
<b>Listeriosis</b>	S	
<b>Lyme disease</b>	S	
<b>Lymphocytic choriomeningitis</b>	S	
<b>Lymphogranuloma venereum</b>	S	
<b>Malaria</b>	S	
<b>Marburg virus disease</b>	S, A, C	DI/SAPP
<b>Measles (rubeola), all presentations</b>	S, A	DI
<b>Melioidosis, all forms</b>	S	
<b>Meningitis</b>		
<ul style="list-style-type: none"> <li>• Aseptic (nonbacterial or viral meningitis) (also see enteroviral infections)</li> <li>• Infants and young children</li> </ul>	S S, C	
<ul style="list-style-type: none"> <li>• Bacterial, gram-negative enteric, in neonates</li> </ul>	S	
<ul style="list-style-type: none"> <li>• Fungal</li> </ul>	S	
<ul style="list-style-type: none"> <li>• <i>Haemophilus influenzae</i> type B, known or suspected</li> </ul>	S, D	U <sup>24Hrs</sup>
<ul style="list-style-type: none"> <li>• <i>Listeria monocytogenes</i></li> </ul>	S	
<ul style="list-style-type: none"> <li>• <i>Neisseria meningitidis</i> (meningococcal), known or suspected</li> </ul>	S, D	U <sup>24Hrs</sup>
<ul style="list-style-type: none"> <li>• <i>Streptococcus pneumoniae</i></li> </ul>	S	

\*\*Strict adherence to standard and isolation precautions, HCWs must wear N95 masks

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
• Tuberculosis (See M. tuberculosis)	S	
• Other diagnosed bacterial infection	S	
<b>Meningococcal disease</b> (sepsis, pneumonia, meningitis)	S, D	U <sup>24Hrs</sup>
<b>Meningococcemia</b> (meningococcal sepsis)	S, D	U <sup>24Hrs</sup>
<b>Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA)</b>	S, C	
<b>Molluscum contagiosum</b>	S	
<b>Monkeypox</b>	S, A, C	LC
<b>Mucormycosis</b>	S	
<b>Multidrug-resistant organism, infection or colonization*</b> (e.g., MRSA, VRE, GNR, resistant <i>Strept pneumoniae</i> )		
• Gastrointestinal	S, C	
• Respiratory	S, C	
• Skin, wound, or burn	S, C	
<b>Mumps</b> (infectious parotitis)	S, D	U <sup>S</sup> x9
<b>Mycobacteria, nontuberculosis</b> (atypical)		
• Pulmonary	S	
• Wound	S	
<b>Mycoplasma pneumoniae</b>	S, D	DI
<b>Necrotizing enterocolitis</b>	S	
<b>Nocardiosis</b> (draining lesions or other presentations)	S	
<b>Orf virus disease</b>	S	
<b>Parainfluenza virus</b> (respiratory infection in infants and young children)	S, C	DI
<b>Parvovirus B19</b>	S, D	DH
<b>Pediculosis</b> (lice)	S, C	U <sup>24Hrs</sup>
<b>Pertussis</b> (whooping cough)*	S, D	U <sup>5DAYS</sup>
<b>Pharyngitis</b> ( <i>Streptococcus</i> group A)	S, D	U <sup>24Hrs</sup>

\* Remove precautions after consulting with Infection Control

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
<b>Pinworm infection</b>	S	
<b>Plague (<i>Yersinia pestis</i>)</b>		
<ul style="list-style-type: none"> <li>• Bubonic (without cough and chest x-ray negative)</li> </ul>	S	U <sup>72Hrs</sup>
<ul style="list-style-type: none"> <li>• Respiratory secretions (draining)</li> </ul>	S, C	U <sup>72hrs</sup>
<ul style="list-style-type: none"> <li>• Pneumonic</li> </ul>	S, D	U <sup>72Hrs</sup>
<b>Pleurodynia</b> (see enteroviral infection)		
<b>Pneumonia</b>		
<ul style="list-style-type: none"> <li>• Adenovirus**</li> </ul>	S, D, C	DI
<ul style="list-style-type: none"> <li>• Bacterial case not listed elsewhere (including gram-negative bacterial cases)</li> </ul>	S	
<ul style="list-style-type: none"> <li>• <i>Burkholderia cepacia</i> in cystic fibrosis patients, including respiratory tract colonization</li> </ul>	S,C	
<ul style="list-style-type: none"> <li>• <i>Chlamydia</i></li> </ul>	S	
<ul style="list-style-type: none"> <li>• Fungal</li> </ul>	S	
<ul style="list-style-type: none"> <li>• <i>Haemophilus influenzae</i>, Type B</li> </ul>		
<ul style="list-style-type: none"> <li>▪ Adults</li> </ul>	S	
<ul style="list-style-type: none"> <li>▪ Infants and children (any age)</li> </ul>	S, D	U <sup>24Hrs</sup>
<ul style="list-style-type: none"> <li>▪ <i>Legionella</i></li> </ul>	S	
<ul style="list-style-type: none"> <li>▪ Meningococcal</li> </ul>	S, D	U <sup>24Hrs</sup>
<ul style="list-style-type: none"> <li>▪ <i>Mycoplasma</i> (primary atypical pneumonia)</li> </ul>	S, D	DI
<ul style="list-style-type: none"> <li>• <i>Pneumocystis jiroveci</i> (<i>carinii</i>)***</li> </ul>	S	
<ul style="list-style-type: none"> <li>• <i>Streptococcus</i>, group A</li> </ul>		
<ul style="list-style-type: none"> <li>▪ Adults</li> </ul>	S, D	U <sup>24Hrs</sup>
<ul style="list-style-type: none"> <li>▪ Infants and small children</li> </ul>	S, D	U <sup>24Hrs</sup>
<ul style="list-style-type: none"> <li>• Varicella zoster</li> </ul>	S, A	DI
<ul style="list-style-type: none"> <li>• Viral</li> </ul>		

\*\* Do not place with immunocompromised patient.

\*\*\* Avoid placement in the same room with other CF patients without *B. cepacia*

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
▪ Adults	S	
▪ Infants and young children (see respiratory infectious disease, acute)		
<b>Poliomyelitis (acute)</b>	S, C	DI
<b>Q fever</b>	S	
<b>Rabies</b>	S	DI
<b>Rat-bite fever</b> ( <i>Streptobacillus moniliformis</i> disease, <i>Spirillum minus</i> disease)	S	
<b>Relapsing fever</b>	S	
<b>Respiratory infectious disease</b> , acute (if not covered elsewhere)		
• Adults	S	
• Infants and young children	S, C	DI
<b>Respiratory syncytial virus infection</b> (in infants and young children and immunocompromised adults)	S, C	DI
Reye syndrome	S	
<b>Rheumatic fever</b>	S	
<b>Rickettsial fever, tickborne</b> (Rocky Mountain spotted fever, tickborne typhus fever)	S	
<b>Rickettsialpox</b> (vesicular rickettsiosis)	S	
<b>Ringworm</b> (dermatophytosis, dermatomycosis, tinea)	S	
<b>Ritter's disease</b> (staphylococcal scalded skin syndrome)	S, C	DI
<b>Rocky Mountain spotted fever</b>	S	
<b>Roseola infantum</b> (exanthem subitum)	S	
<b>Rotavirus infection</b> (see gastroenteritis)	S, C	DI
<b>Rubella</b> (German measles) (also see congenital rubella)	S, D	U <sup>7DAYS</sup>
<b>Rubeola</b>	S, A	DI
<b>Salmonellosis</b> (typhoidal or not typhoidal, diapered or incontinent)	S, C	DI
<b>SARS</b> (Severe Acute Respiratory Syndrome)	S, A, D, C	DI

**Appendix 1**  
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INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
<b>Scabies</b>	S, C	U <sup>24Hrs</sup>
<b>Scalded skin syndrome, staphylococcal</b> (Ritter's disease)	S, C	DI
<b>Scarlet fever</b>	S, C	U <sup>24Hrs</sup>
<b>Schistosomiasis</b> (bilharziasis)	S	
<b>Shigellosis</b> (see gastroenteritis)		
<b>Smallpox</b> (variola)	S, C, A	DI
<b>Sporotrichosis</b>	S	
<b><i>Spirillum minus</i> disease</b> (rat-bite fever)	S	
<b>Staphylococcal disease</b> ( <i>S. aureus</i> )		
• Pneumonia	S	
• Skin, wound, or burn		
▪ Major	S, C	DI
▪ Minor or limited	S	
▪ MRSA (see MRSA)		
<b><i>Streptobacillus moniliformis</i> disease</b> (rat-bite fever)	S	
<b>Streptococcal disease</b> (group A <i>Streptococcus</i> )		
• Skin, wound, or burn		
▪ Major	S, C	U <sup>24Hrs</sup>
▪ Minor or limited	S	
• Endometritis (puerperal sepsis)	S	
• Pharyngitis in infants and young children	S, D	U <sup>24Hrs</sup>
• Pneumonia in infants and young children	S, D	U <sup>24Hrs</sup>
• Scarlet fever in infants and young children	S, D	U <sup>24Hrs</sup>
• Severe invasive disease (necrotizing fasciitis, toxic shock syndrome)	S, D	U <sup>24Hrs</sup>
<b>Streptococcal disease</b> (group B <i>Streptococcus neonatal</i> )	S	
<b>Streptococcal disease</b> (not group A or B) unless covered elsewhere	S	

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
<b>Strongyloidiasis</b>	S	
<b>Syphilis</b>		
<ul style="list-style-type: none"> <li>• Skin and mucous membrane, including congenital, primary, and secondary</li> </ul>	S	
<ul style="list-style-type: none"> <li>• Latent (tertiary) and seropositivity without lesions</li> </ul>	S	
<b>Tapeworm disease</b>		
<ul style="list-style-type: none"> <li>• <i>Hymenolepis nana</i> (fish)</li> </ul>	S	
<ul style="list-style-type: none"> <li>• <i>Taenia solium</i> (pork)</li> </ul>	S	
<ul style="list-style-type: none"> <li>• <i>Taenia saginata</i> (beef)</li> </ul>	S	
<b>Tetanus</b>	S	
<b>Tinea</b> (fungal infection, dermatophytosis, dermatomycosis, ringworm)	S	
<b>Toxoplasmosis</b>	S	
<b>Toxic shock syndrome</b> (staphylococcal disease, streptococcal disease)	S	
<b>Trachoma, acute</b>	S	
<b>Trench mouth</b> (Vincent's angina)	S	
<b>Trichinosis</b>	S	
<b>Trichomoniasis</b>	S	
<b>Trichuriasis</b> (whipworm disease)	S	
<b>Tuberculosis</b> ( <i>Mycobacterium tuberculosis</i> )		
<ul style="list-style-type: none"> <li>• Extra-pulmonary (no draining lesions, meningitis)</li> </ul>	S	
<ul style="list-style-type: none"> <li>• Extra-pulmonary (draining lesions)</li> </ul>	S, A	
<ul style="list-style-type: none"> <li>• Pulmonary or laryngeal (confirmed or suspected)*</li> </ul>	S, A	
<ul style="list-style-type: none"> <li>• Skin-test positive with no evidence of current pulmonary disease</li> </ul>	S	

\* Discontinue isolation (confirmed cases) when 14 days anti-TB therapy; 3 negative culture specimens; and, clinical improvement. Discontinue isolation (suspected cases) if patient has 3 negative culture specimens taken.

**Appendix 1**  
**TYPE AND DURATION OF PRECAUTIONS NEEDED FOR**  
**SELECTED INFECTIONS AND CONDITIONS**

INFECTION/CONDITION	PRECAUTIONS	
	TYPE	DURATION
<b>Tularemia</b>		
• Draining lesion	S	
• Pulmonary	S	
<b>Typhoid (<i>Salmonella typhi</i>) fever</b> (see gastroenteritis)		
<b>Typhus</b> (endemic and epidemic)	S, C	DI
<b>Urinary tract infection</b> (including pyelonephritis, with or without urinary catheter), except MDRO	S	
<b>Varicella zoster</b> (see chickenpox)		
<b><i>Vibrio parahaemolyticus</i></b> (see gastroenteritis)		
<b>Vincent's angina</b> (see trench mouth)		
<b>Viral hemorrhagic fever</b> (Lassa, Ebola, Marburg, Crimean-Congo fever viruses)	S, C, D	DI
<b>Viral respiratory disease</b>		
• Adults	S	
• Infants and young children (see respiratory infectious disease, acute)		
<b>Whooping cough</b> (see pertussis)	S, D	U <sup>5DAYS</sup>
<b>Wound infections</b>		
• Major	S, C	DI
• Minor or limited	S	
<b><i>Yersinia enterocolitica</i> gastroenteritis</b> (see gastroenteritis)		
<b>Zoster (<i>varicella zoster</i>), shingles</b> (see chicken pox)		
• Disseminated in any patient	S, A, C	DI/LC
• Localized in immunocompromised patient	S, A, C	DI/LC
• Localized in normal patient	S	
<b>Zygomycosis</b> (phycomycosis, mucormycosis)	S	

TITLE/DESCRIPTION: <b>INITIATING AND DISCONTINUING ISOLATION</b>		INDEX NUMBER: <b>ICM – III-07</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines on the process of initiating and discontinuing isolation precautions for patients with a confirmed or suspected infectious diseases that carries the risk of nosocomial transmission.

## COMMENTS

1. Standard precautions must always be observed while delivering direct patient care.
2. Appropriate isolation signs must be placed on the doors as needed.
3. Patients requiring isolation precaution can be identified by laboratory results, physician diagnosis, or any existing flagging system.

## PROCEDURE

### A. Physician

1. Identify patients with either a suspected or confirmed infectious diseases.
2. Where possible, this information should be available on the patient's chart upon admission or as soon as the infection becomes apparent.

### B. Nurses

1. Confer with physician(s) regarding suspected/diagnosed infections.
2. Notify Infection control practitioner (ICP) for assistance regarding the type of isolation to be used.
3. Request the appropriate single room from the Admissions Office Bed Coordinator.
4. Place the patient in an appropriate room (some patients with the same type of infection can be cohorted; ICP will advise).
5. Place the appropriate isolation sign on the outside of the door of the patient's room.
6. Ensure that the appropriate isolation precautions are maintained for the duration of the infectivity of the patient.
7. Fill out a Report of Communicable Diseases Form for all diagnosed cases of reportable diseases for the MOH; refer to policy [ICM-I-05](#) *Reporting Communicable Diseases to the Ministry of Health*.
8. Discontinue isolation in consultation with ICP.
9. Notify the Admissions Office when isolation is discontinued.
10. Request housekeeping staff to carry out a terminal cleaning of the isolation room.
11. Return reusable instruments to the department responsible for reprocessing used medical instruments and supplies.
12. Ensure cleaning and storage of other patient care items/equipment as necessary.

### C. Infection control practitioner

1. Consult with nursing staff regarding the type of isolation.
2. Confer with the attending physician regarding the patient's clinical assessment.
3. Monitor the patient's infectious status and make recommendations on rescreening, maintaining, or discontinuing isolation.
4. Monitor healthcare workers compliance with standard and isolation precautions and give consultations where necessary.

TITLE/DESCRIPTION: <b>SINGLE ROOM USE FOR ISOLATION PRECAUTIONS</b>		INDEX NUMBER: <b>ICM – III-08</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines on the appropriate use of single rooms for isolating patient suspected or confirmed communicable diseases.

## REFERENCE

Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18: Isolation precautions. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)

## COMMENTS

1. Appropriate patient placement is an important component of isolation precautions, which are designed to do the following:
  - a. Provide a physical barrier around the patient infected or colonized with epidemiologically significant microorganisms.
  - b. Remind personnel and visitors to observe infection control measures.
2. Consult with the Infection control practitioner (ICP) to verify proper patient placement as necessary.

## PROCEDURE

### A. Single Rooms

1. Use a single room with hand hygiene and toilet facilities for isolation purposes.
2. Use a single room with negative pressure (airborne infectious isolation room (AIIR)) for airborne isolation precautions.
3. Post the appropriate isolation sign on the door to indicate the isolation precaution(s) required.
4. Place isolation carts with the necessary supplies outside the single room.
5. Consult with Infection Control to cohort patients with identical organisms/disease when there is a shortage of single rooms.

### B. Indication for single room

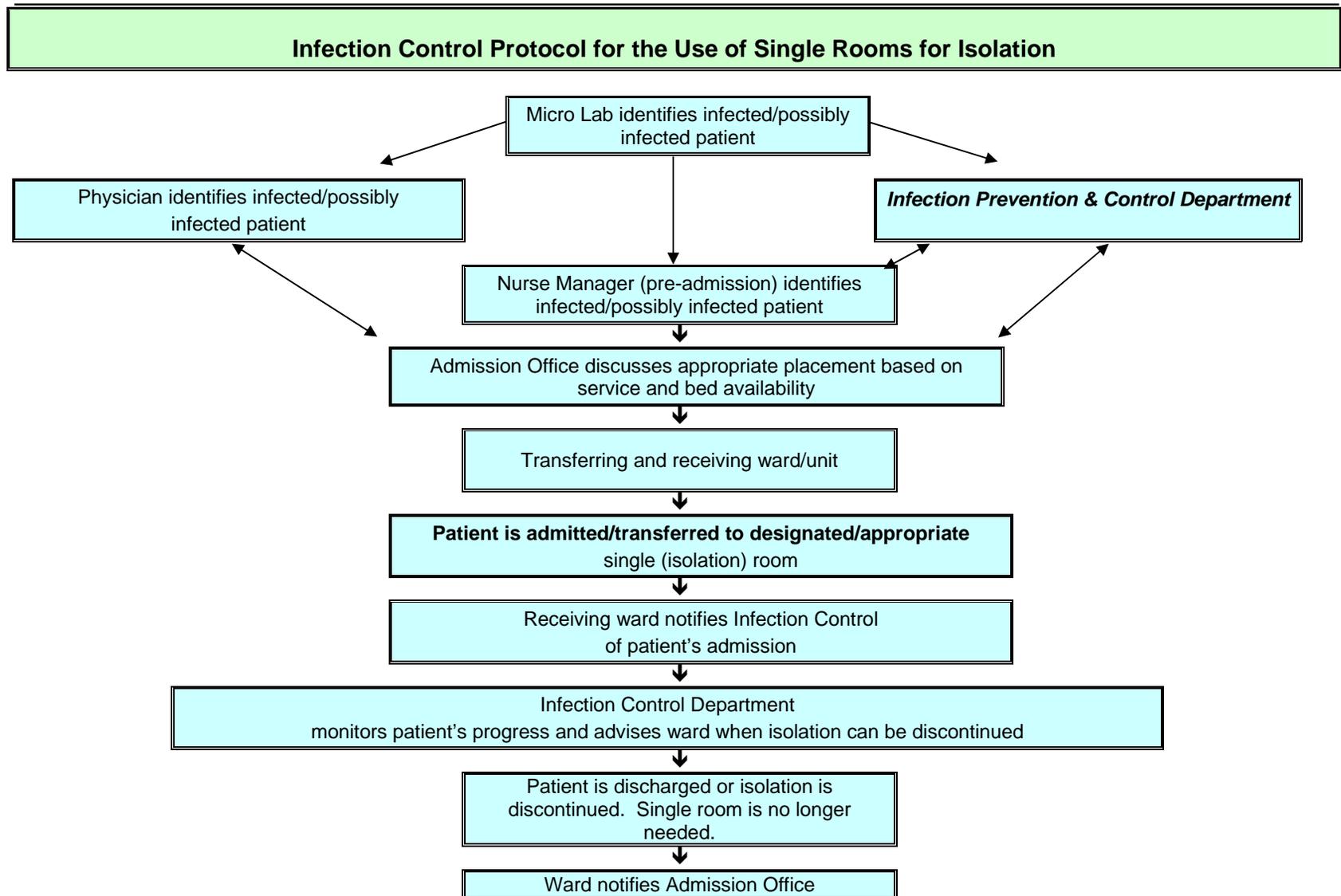
1. Refer to policy [ICM-III-06](#) *Isolation Systems: A Quick Reference Guide* to initiate isolation based on the type of suspected/diagnosed infection or infectious disease.
2. The patient is placed in a single room for the duration of communicability or the infectious period of the disease.
3. When a patient has poor hygienic habits and cannot comply with infection control practices, consult with ICP.

**C. Admission process**

1. The attending physician documents confirmed or suspected infectious status of patients that require isolation.
2. Admitting wards (OPD, ER) notify Infection Prevention & Control.
3. ICP and the Admissions Department will confer to determine the need for a single room.
4. The receiving ward and admission office shall notify ICP when a patient is placed in single-room isolation.
5. If a single room in an OFF-SERVICE ward is utilized, the Admissions Department shall transfer the patient to the appropriate service ward as soon as the required room becomes available.
6. The ICP shall monitor the patient's progress and advise on rescreening and discontinuation of isolation.
7. The ward staff shall notify the Admissions Office when isolation is discontinued.

Refer to [Flowchart 1 – III-08](#) *Infection Control Protocol for Use of Single Room for Isolation*.

Flowchart 1



TITLE/DESCRIPTION: <b>TRANSPORTING PATIENTS ON ISOLATION PRECAUTIONS</b>		INDEX NUMBER: <b>ICM – III-09</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide clear guidelines to safely transporting isolated patients within the facility while preventing or minimizing infection transmission.

## COMMENT

1. Transport of isolated patients should be limited to essential purposes only, such as diagnostic and therapeutic procedures that cannot be performed in the patient's room.
2. When patient transport is necessary, appropriate barriers (e.g., masks, leak-proof dressing) should be worn to reduce potential contamination of the environment and the spread of infection.
3. Refer to policy [ICM-III-02](#) *Isolation (Expanded) Precautions* in this manual for specific isolation precautions.
4. All staff must observe Standard Precautions at all times.

## PROCEDURE

### A. Ward

1. Notify the receiving department to which the patient is being transported of the isolation precautions in effect.
2. Instruct the patient of the ways that he/she can assist in maintaining appropriate precautions to prevent transmission of the infection.
3. Dress wounds with impervious dressings as required.
4. Dress the patient in a clean gown.
5. Explain to the patient the need for the protective apparel that he/she is required to wear.
  - a. Put a mask on any patient who is in airborne isolation.
6. Cover the wheelchair/stretchers with a sheet before moving the patient.
7. Cover the patient with a clean sheet.
8. Transport the patient to the area as required.
9. Return the patient to the isolation room as soon as circumstances allow.
10. Clean and disinfect the wheelchair or stretchers with the approved disinfectant.

### B. Receiving Department

1. HCWs are to use appropriate personal protective equipment (PPE) when managing the patient.
2. Observe the specified isolation techniques.
3. Adhere to the Hand Hygiene policy.
4. Arrange for the patient's return to his/her ward as soon as possible.
5. Change linens and clean equipment and environmental surfaces as indicated before receiving the next patient.

### C. Transferring the patient to another facility

1. Inform the receiving facility and the emergency vehicle personnel in advance about the type of isolation and standard precautions (PPE) required.
2. Provide complete information on the infectious status of the patient to the receiving facility.

TITLE/DESCRIPTION: <b>PATIENTS AND SITTERS IN ISOLATION: INFECTION CONTROL EDUCATION AND COMPLIANCE</b>		INDEX NUMBER: <b>ICM – III-10</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To give guidelines on how to manage and achieve compliance from approved sitters of patients in isolation as per the institution's policy and procedures.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18: Isolation precautions. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007

## COMMENTS

1. Apply hospital administrative policies where applicable.
2. In general, sitters are not allowed for patients who are being treated in isolation (under airborne, contact, or droplet precautions). However, exceptions to this policy can be made after consultation and upon approval of the Director of the Infection Prevention and Control Program or a designee.
3. Every patient and approved sitter in isolation will follow standard and isolation precautions.
4. Compliance with all infection control practices is mandatory (e.g., those regarding hand hygiene, standard precautions, medical and nursing instructions, PPE).
5. Non-compliance with isolation regulations or infection control recommendations can contribute to the spread of infection to other patients, healthcare workers, visitors, and the environment.
6. It is the responsibility of the hospital staff to educate the isolated patient and approved sitter about all infection control rules and recommendations.

## PROCEDURE

### A. Healthcare workers

1. The Most Responsible Physician or his/her designee is responsible for ensuring that the necessary education is given to the patient and sitter.
2. Each patient and sitter will be provided with specific information and will be given positive educational reinforcement in their language.
  - a. Evidence that this education has taken place will be documented in the patient's medical record by the physician.
  - b. The approved sitter will be informed at this time that sitter authorization will be withdrawn if isolation regulations are not followed.

- c. The patient, sitter, and physician will sign the education consent form, and this form will be kept in the medical record as evidence that they agree to the isolation conditions.
3. Physicians, infection control practitioner, nurses, and health educators will share the responsibility of monitoring the compliance of the patient in isolation and his/her approved sitter.
4. The Infection Prevention and Control department (IP&C) should be informed immediately of any breaches of compliance.
  - a. The IP&C will recommend that further patient education should be given.
5. Any repeated breach of compliance should be referred to the IP&C, and the sitter's authorization can be withdrawn.
6. The Security Department will take whatever actions necessary to ensure that the patient in isolation and his/her approved sitter comply with infection control isolation precautions (if necessary).

**B. Patients and sitters**

1. It is the responsibility of every patient and his/her approved sitter to comply with all infection control rules and regulations (listed on the sign on the door or conveyed through medical/nursing instructions).
2. It is the responsibility of the hospital staff to monitor the compliance of the patient in isolation and his/her allowed sitter with infection control isolation recommendations.
3. Patients and their sitters who receive education from the staff regarding infection control isolation recommendations and still do not comply with these recommendations will be subject to measures to enforce the standards and ensure their compliance.

TITLE/DESCRIPTION: <b>NEGATIVE PRESSURE ROOM MONITORING</b>		INDEX NUMBER: <b>ICM – III-11</b>
EFFECTIVE DATE: <b>01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide instructions on the monitoring and maintenance of the negative pressure rooms to Nursing, Utilities and Maintenance (U&M) departments, and the Infection Control Practitioner (ICP).

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18: Isolation precautions. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Infection Prevention and Control Manual, [ICM-III-02](#) *Isolation (Expanded) Precautions*
3. Infection Prevention and Control Manual, [ICM-III-09](#) *Transporting Patients on Isolation Precautions*

## COMMENTS

1. Maintenance Log: Used for keeping records of all malfunctions of negative pressure room monitors. The log should be kept on the ward and be accessible to all staff. Forms must be completed whenever the alarm system is activated (See attachment 1).
2. Activation of the alarm system when negative pressure ventilation fails: Visible red flashing lights and/or audible sound comes from the monitor.
3. For the safety of healthcare workers, patients, and visitors, negative pressure rooms occupied by patients requiring airborne isolation must be checked daily (refer to step A.3).

## PROCEDURE

### A. Routine monitoring of negative pressure rooms:

1. Negative pressure room and ventilation requirements
  - a. Conduct and document monthly checks on *all* negative pressure rooms.
  - b. Conduct visual checks for the direction of air flow (using smoke trails or flutter strips) on all rooms where patients are in airborne isolation for query or confirmed airborne transmissible diseases (e.g., pulmonary TB, chicken pox, measles or hemorrhagic fever) on *weekends*.
  - c. Follow the procedure of this IPP if any room fails inspection.
  - d. All documentation must be forwarded to the Environmental Health and Occupational Health Safety (EHOHS) section of the IP&C department.
2. Negative pressure rooms in use
  - a. Conduct *daily* visual checks for the direction of air flow on all rooms where patients are in airborne isolation for query or confirmed airborne transmissible diseases (e.g., pulmonary TB, chicken pox, measles or hemorrhagic fever).
  - b. Follow the procedure of this IPP if any room that fails inspection.
  - c. All documentation must be sent to the Infection Control department.

**B. Negative pressure ventilation failure:**

1. Unit staff must respond to negative pressure failure.
2. Nursing staff will:
  - a. Place a surgical mask on the patient in airborne isolation.
  - b. Keep the door closed at all times.
  - c. Notify the Utilities & Maintenance (U&M) department of the location and problem.
  - d. Notify IP&C during the regular work week by paging the ICP that is covering the unit/area.
    - i. If an event occurs at night or on the weekend, IP&C will be notified on the next working day.
    - ii. Follow *steps listed in section 3* below.
  - e. Document all information on the Negative Pressure Room Maintenance Log form.
  - f. Notify IP&C regarding the findings and required follow-up.
3. U&M staff must respond immediately to the area and
  - a. Assess whether the room(s) is/are maintaining negative pressure.
  - b. Communicate their findings to the Nurse Manager or designee.
  - c. Document their findings on the Negative Pressure Room Maintenance Log form.
4. Nursing staff  
If U&M declares the occupied room is no longer maintaining negative pressure, follow these steps:
  - a. For patients who are in airborne isolation (for pulmonary TB, chicken pox, measles or hemorrhagic fever), contact IP&C immediately.
    - i. The patient must be transferred to another negative pressure room immediately.
    - ii. Put a surgical mask on the patient before transporting. Refer to policy [ICM-III-09](#) *Transporting Patients on Isolation Precautions*.
    - iii. U&M can then proceed with repairs.
  - b. If the patient is not in isolation:
    - i. The patient can be moved to another room.
    - ii. U&M can proceed with repairs.
  - c. If the room is unoccupied, then U&M can proceed with repairs immediately.
5. The IP&C department will
  - a. Assess the patient/situation with regard to infectious risk.
  - b. Provide infection control recommendations based on the risk assessment to minimize transmission of the disease.
  - c. Document all information on the Negative Pressure Room Maintenance Log form and patient chart (as required).
  - d. Complete any follow-up with the unit staff and the maintenance log form is kept in the Infection Prevention and Control Department.



### **NEGATIVE PRESSURE ROOM MAINTENANCE LOG**

**DEPARTMENT:** \_\_\_\_\_

DATE	TIME	ROOM	DESCRIBE PROBLEM	ACTION TAKEN	
				UTILITIES AND MAINTENANCE	INFECTION CONTROL

**INSTRUCTIONS:**

1. The initiating department must document all information clearly, including initials and badge number.
  - a. Notify U&M of the problem.
  - b. Notify the Infection Prevention and Control Department.
2. U&M staff must respond and troubleshoot the problem.
  - a. Assess whether the room is maintaining negative pressure.
  - b. Findings must be explained to department staff and documented on this form, including initials and badge number.
3. Department staff must notify Infection Prevention and Control.
  - a. IP&C will assess any infectious risk.
  - b. Findings (i.e., whether there is a transmission risk) must be explained to department staff and documented, including initials and badge number.

## Section 4: INFECTION CONTROL POLICIES RELATED TO SPECIFIC DISEASES

Section	Title	Page #
ICM – IV-01	<b>Multidrug Resistant Organisms (MDRO) Management</b>	<b>71</b>
ICM – IV-02	<b>Methicillin Resistant <i>Staphylococcus Aureus</i> (MRSA) Management</b>	<b>73</b>
ICM – IV-03	<b>Vancomycin Resistant <i>Enterococcus</i> (VRE) Management</b>	<b>79</b>
ICM – IV-04	<b>Hepatitis A Virus Exposure Management</b>	<b>81</b>
ICM – IV-05	<b>Viral Hemorrhagic Fever Management</b>	<b>83</b>
ICM – IV-06	<b>Pediculosis / Scabies Management</b>	<b>87</b>
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ICM – IV-08	<b>Rabies Specimen Acquisition Handling and Shipment to Ministry of Agriculture Laboratory</b>	<b>94</b>
ICM – IV-09	<b>Management of Patients With Suspected Severe Acute Respiratory Syndrome (SARS)</b>	<b>95</b>
ICM – IV-10	<b>Rapid MRSA Surveillance <small>(New)</small></b>	<b>97</b>



TITLE/DESCRIPTION: <b>MULTIDRUG RESISTANT ORGANISMS (MDRO) MANAGEMENT</b>		INDEX NUMBER: <b>ICM – IV-01</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

This policy outlines the required steps needed to prevent the transmission of multidrug-resistant microorganisms (MDROs) within the hospital.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18: Isolation precautions. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007

## COMMENTS

1. MDROs are bacteria that are resistant to many or all antibiotics.
2. Methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococci (VRE) are the primary resistant microorganisms encountered in the hospital; refer to policy [ICM-IV-02](#) *Methicillin-Resistant Staphylococcus aureus Management* and [ICM-IV-03](#) *Vancomycin-Resistant Enterococcus Management*.
3. The emergence of other gram-positive and gram-negative drug-resistant microorganisms is on the rise.
4. STANDARD PRECAUTIONS MUST BE OBSERVED FOR ALL PATIENT CARE

## PROCEDURE

### A. Notification of the MDRO

1. The microbiology lab or Infection Control Practitioner (ICP) will notify the ward of the MDRO.
2. Patients previously or discharged MDRO positive are flagged in MDRO documentation.

### B. Management of MDRO-positive patients

1. Initiate contact precautions in addition to standard precautions.
2. Patient must be in a single room or can be cohorted with another patient with the same organism.
3. MDRO-positive patients who are in multi-bed rooms can be managed temporarily while waiting to be transferred to a single room or an appropriate cohort.
  - a. Place a sign on the cubicle or curtain of the patient's bed
  - b. Ensure easy access to PPE and alcohol-based hand rub
  - c. Practice strict standard precautions between interactions with patients in the room

- d. Transfer to a single room or cohort with another patient with the same organism as soon as possible
4. Place a contact isolation sign on the outside of the isolation room door.
5. Practice strict hand hygiene.
6. Cohort non-critical items such as stethoscopes and pressure cuffs with the patient.
7. Store the minimum amount of supplies in the patient's room.
8. Use an isolation cart for extra supplies (kept outside the room).
9. Ensure that all staff understand and comply with the isolation precautions and hand hygiene protocol.
10. Limit the patient's activity outside the room to treatments or tests.
11. Notify receiving departments/wards (e.g., Radiology, Endoscopy, Clinics, OR) of the patient's isolation status when the patient must be transported for treatment/tests. Refer to policy [ICM-III-09](#) *Transporting Patients on Isolation Precautions*.
12. Ensure concurrent and terminal cleaning of the isolation room and equipment as per housekeeping procedure.
13. Handle/discard contaminated items as per Standard Precautions. Refer to policy [ICM-II-03](#) *Standard Precautions*.

**C. Medical**

1. Request Infectious Diseases consultation as needed.
2. Discharge the patient from the hospital once his/her medical condition allows.

**D. Clearance/Discontinuation of Isolation**

1. Discontinue isolation of MDRO-positive patient after consultation with the ICP.

**E. Screening of healthcare workers (HCWs) and the environment**

1. Do not screen HCWs or the environment because it is not typically indicated and incurs unnecessary costs.
2. IP&C may initiate such measures when indicated.

**F. Outbreak Management**

1. Management of outbreaks will be coordinated by the ICP and will require the cooperation of medical, nursing, laboratory and other departments.

**G. Cleaning of the patient's room**

1. Perform regular or terminal cleaning as per housekeeping protocol.

**H. Linen**

1. Keep a linen hamper in the isolation area.

TITLE/DESCRIPTION: <b>METHICILLIN-RESISTANT <i>STAPHYLOCOCCUS AUREUS</i> (MRSA) MANAGEMENT</b>		INDEX NUMBER: <b>ICM – IV-02</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

This policy describes the steps needed to prevent the spread of methicillin-resistant *Staphylococcus aureus* (MRSA) to patients, staff, and visitors.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 70: Staphylococcus. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. APIC Guide to the elimination of methicillin-resistant staphylococcus aureus (MRSA) transmission in hospital settings, March 2007
3. Infection Prevention and Control Manual, [ICM-IV-10](#) *Rapid MRSA surveillance*

## COMMENTS

1. MRSA refers to strains of *Staphylococcus aureus* that are resistant to synthetic penicillin (oxacillin, nifloxacin, and methicillin). It is also resistant to cephalosporins, other betalactam antibiotics and sometime to other antibiotics (erythromycin, clindamycin, aminoglycoside, and quinolones).
2. Concerns about MRSA are related to the potential for nosocomial transmission and the limited number of antibiotics available to treat infections caused by this microorganism.
3. Screening can be initiated in the Emergency Department (ER).
4. Patients being admitted from the ER who qualify for screening should not be held in the ER awaiting screening results, as this will unnecessarily delay admission.
5. Initiate empiric contact isolation precautions during the screening procedure.
6. STANDARD PRECAUTIONS MUST BE OBSERVED FOR ALL PATIENT CARE.

## PROCEDURE

### A. Management of patients with suspected MRSA infection or colonization

1. Initiate empiric contact isolation precautions during the screening procedure (if possible).
  - a. Screen all patients who are:
    - i. Admitted to the Intensive Care Units.
    - ii. Transferred from other hospitals or have been treated in another hospital/clinic within the past six months.
    - iii. Undergoing liver or cardiac surgery (preoperatively) or receiving continuous ambulatory peritoneal dialysis (CAPD) or hemodialysis.
    - iv. Known to be previously MRSA positive.
    - v. Roommates of positive patients not on isolation precautions.
  - b. Sites to screen include:
    - i. Anterior nares.

- ii. Non intact skin areas (e.g., tracheostomy, pressure sores or surgical wounds).
- iii. Neonates and pediatric patients awaiting liver or cardiac surgery should also have both the groin and axilla screened.
- c. Specimen collection for nares only:
  - i. Use sterile red-top tube with double-tip dry culture swab for rapid testing. Refer to policy [ICM-IV-10](#) *Rapid MRSA Surveillance*.
- d. Specimen collection for other sites:
  - ii. Use the packet with a sterile swab stick with transport medium.
  - iii. Clean the site with normal saline to remove debris before swabbing.
  - iv. Moisten the swab in transport medium before swabbing the site.
  - v. Use the same swab for identical sites: one swab for both axilla and one swab for both inguinal areas.
  - vi. Use separate swabs to screen other sites.  
NB: The accompanying requisition should request “MRSA screen.”
- e. Patient placement upon admission:
  - i. Request a single room for contact isolation from the Admission Office. If a single room is not available then two or more patients receiving MRSA screening may be cohorted after consultation with infection control.
  - ii. Observe contact isolation precautions in addition to standard precautions.
    - Place a contact isolation sign on the outside of the isolation room door or on the bed if the patient is sharing a room.
    - Ensure that all staff understand and comply with the isolation precautions and hand hygiene policy.
    - Change all PPE and perform hand hygiene between patients in the same room (barrier precautions).
    - Cohort non-critical items such as stethoscopes and pressure cuffs along with each patient.
    - Store the minimum amount of supplies in the patient room.
  - iii. Limit the patient’s activities outside of the ward.
  - iv. Notify receiving departments/wards (e.g., Radiology, Endoscopy, Clinics, OR) of the patient’s isolation status when the patient must be transported for treatment/tests. Refer to policy [ICM-III-09](#) *Transporting Patients on Isolation Precautions*.
  - v. If the patient is MRSA positive, refer to “Management of MRSA-positive patients” below.

## B. Management of MRSA-positive patients

1. Patients determined to be MRSA positive from surveillance screening (rapid test) or clinical specimens upon or after admission.
2. Readmitted patients that were MRSA positive on discharge (flag/alert).
3. Microbiology Laboratory:
  - a. Notify the ward of MRSA-positive patients.
  - b. Notify the Infection control practitioner (ICP) of all new positive MRSA cultures.
4. Nursing:
  - a. Request a single room for contact isolation from Admission Office. If a single room is not readily available, two or more MRSA-positive patients can be cohorted after consultation with infection control.
  - b. MRSA-positive patients who are in multi-bed rooms can be managed temporarily while waiting to be transferred to a single room or an appropriate cohort.
    - i. Place a sign on the cubicle or curtains of the patient’s bed
    - ii. Ensure easy access to PPE and alcohol-based hand rub
    - iii. Practice strict standard precautions between interactions with patients in the room

- iv. Transfer to a single room or cohort with another patient with the same organism as soon as possible
  - c. Observe contact isolation precautions in addition to standard precautions with all patient care activities.
    - i. Place a contact isolation sign on the outside of the isolation room door.
    - ii. Ensure that staff understand and comply with the isolation precautions and hand hygiene protocol.
    - iii. Cohort non-critical items such as stethoscopes and pressure cuffs along with the patient.
    - iv. Store the minimum amount of supplies in the patient's room.
    - v. Use an isolation cart for extra supplies (kept outside the room).
  - d. Rescreening of MRSA-positive patients must occur in consultation with the ICP.
  - e. Screen exposed patients who shared a room with a known MRSA-positive patient for more than 48 hours (see Procedure #4).
  - f. Limit the patient's activities outside of the ward.
  - g. Notify receiving departments/wards (e.g., Radiology, Endoscopy, Clinics, OR) of the patient's isolation status when the patient must be transported for treatment/tests. Refer to policy [ICM-III-09](#) *Transporting Patients on Isolation Precaution*.
  - h. Maintain contact isolation during decolonization process.
  - i. Ensure concurrent and terminal cleaning of the isolation room and equipment as per housekeeping procedure.
  - j. Handle/discard contaminated items as per standard precautions. Refer to policy [ICM-II-03](#) *Standard Precautions*.
  - k. Cohorting nursing staff providing direct patient care is recommended.
5. Medical:
- a. Restrict antibiotic use (especially broad-spectrum antibiotics) and invasive devices when possible.
  - b. Discharge the patient when his/her medical condition allows.
  - c. Seek the advice of Infectious Diseases Consultants or ICPs regarding possible decolonization.

### C. Discontinuation of contact isolation

1. Discontinuation of isolation precautions for a MRSA-positive patient must occur in consultation with the ICP and MRP.
2. Criteria for discontinuing isolation:
  - a. Antibiotic therapy is completed at least three days prior to rescreening.
  - b. Vancomycin levels should be zero prior to rescreening.
  - c. Three consecutive negative culture results (taken 3 days apart) taken from nares and all previously positive sites.
  - d. The patient should not be receiving antibiotic therapy at any time during the screening process.

### D. Rescreening MRSA-positive patients for the purpose of discontinuing contact isolation

1. Sites to screen are:
  - a. Anterior nares
  - b. Previously positive sites
  - c. Any indwelling catheter sites
  - d. Non intact skin areas (e.g., tracheostomy, pressure sores or surgical wounds)
2. Specimen Collection:
  - a. Refer to policy [ICM-IV-10](#) *Rapid MRSA Surveillance* for nares only.

- b. For other sites, use the packet with blue-top sterile swab stick with gel.
  - i. Moisten the swab in transport medium before swabbing the site.
  - ii. Use the same swab for identical sites (e.g., axilla and groin).
  - iii. Use separate swabs to screen other sites.

NB: The accompanying requisition should request “MRSA screen.”

**E. Screening of healthcare workers (HCWs) and the environment**

1. Do not screen HCWs or the environment because it is not normally indicated and incurs unnecessary costs.
2. IP&C may initiate such measures when indicated.

**F. Outbreak management**

1. Management of outbreaks will be coordinated by the ICP and will require the cooperation of medical, nursing, laboratory and other departments.

**G. Cleaning of the patient’s room**

1. Regular cleaning as per housekeeping protocol.
2. Terminal cleaning upon patient discharge.
3. The room can be used as soon as all cleaned surfaces are dry.

**H. Linen**

1. Keep a linen hamper in the isolation area.

**I. Ambulation**

1. Patients with infected body fluids:
  - a. If they are able to contain their body fluids (secretions, urine, stool), patients may walk in the corridors but cannot enter the visitor/patient area.
  - b. If unable to contain their body fluids, patients must be encouraged to stay in their rooms and be reassessed frequently.

**J. Sitters/visitors**

1. Provide information about MRSA as required.
2. Hand hygiene must be emphasized after patient contact.
3. Sitters and visitors must be instructed to wear appropriate PPE if assisting with direct patient care.

**K. Decolonization protocol** (refer to [Form 1– IV-01](#) *MRSA Decolonization Procedure*)

1. Treat nares topically for periods not exceeding seven days with Bactroban (Mupirocin) cream (only if the organism is Mupirocin-sensitive); restrict use, as resistance to this agent is well documented.
2. ICP will assess patients on an individual basis to determine the need for decolonization with chlorhexidine wash (suppressive therapy) to reduce/inhibit MRSA skin colonization.
3. Apply this protocol to patients awaiting liver transplants or cardiac or orthopedic surgery and to those who regularly attend other departments for therapy, such as dialysis patients or those requiring physiotherapy.



**Form 1 – IV-01**  
MRSA DECOLONIZATION PROCEDURE

**Assessment for decolonization will be performed by the Infection Control Practitioner (ICP) in consultation with the attending physician and an Infectious Disease Consultant.**

**Maintain Contact Isolation during decolonization treatment.**

**SUPPLIES:** Chlorhexidine 4%  
Mupirocin/Bactroban, per MD order  
Clean linens for the bed and patient  
Personal protective equipment (PPE)

1. Spread full-strength Chlorhexidine 4% solution from neck to toes, ensuring coverage of underarms, groin, and between fingers and toes.
  - Cover the patient with a sheet and wait for 10 minutes.
  - Rinse with warm water.
  - Change the bed linens and the patient's clothing completely after each bath/shower.
  - Repeat this process twice a day.
  - Shampoo hair with the Chlorhexidine solution for 3 days
2. Apply Mupirocin/Bactroban ointment to anterior nares (inside nose) after Chlorhexidine treatment, when the patient is dry and dressed as ordered by the MD.

*NB: Mupirocin should not be applied to open wounds.*

3. These treatments must be given for 7 consecutive days.
4. Take a complete set of cultures from nares and previously positive sites 72 hrs after decolonization
  - If 1<sup>st</sup> set of samples is negative repeat cultures 48 hrs later
5. Three negative cultures are required before the patient is cleared of MRSA and can be taken out of isolation.

*NB: These results will be assessed by the ICP*

**NOTES:**

- The patient must not be on antibiotics at the time of screening.
- If any swab is positive, stop the screening process until further assessment.
- Please complete all documentation on this form. The ICP will collect the form when completed.



MRSA DECOLONIZATION RECORD

START DATE: \_\_\_\_\_

TREATMENT TIME	CHLORHEXIDINE 4% WASH & SHAMPOO	MUPIROCIN/BACTROBAN OINTMENT	INITIALS
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			
Day 6			
Day 7			

SCREENING 1:                      DATE DUE: \_\_\_\_\_                      DONE: \_\_\_\_\_

SCREENING 2:                      DATE DUE: \_\_\_\_\_                      DONE: \_\_\_\_\_

SCREENING 3:                      DATE DUE: \_\_\_\_\_                      DONE: \_\_\_\_\_

COMMENTS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TITLE/DESCRIPTION: <b>VANCOMYCIN-RESISTANT ENTEROCOCCI (VRE) MANAGEMENT</b>		INDEX NUMBER: <b>ICM – IV-03</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To describe the steps needed to prevent the spread of vancomycin-resistant enterococci (VRE).

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18: Isolation precautions. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007

## COMMENTS

1. VRE are inherently resistant to most antibiotics and can easily acquire resistance to the remaining antibiotics. In addition, they are capable of transferring this resistance to other bacteria such as staphylococci.
2. VRE are dispersed easily into the environment and are easily spread by the intermittent colonization of the hands of healthcare workers (HCWs). Items such as bedrails, stethoscopes, blood pressure cuffs are reservoirs for VRE.
3. STANDARD PRECAUTIONS MUST BE OBSERVED FOR ALL PATIENT CARE

## PROCEDURE

### A. Screening for VRE

1. Screen all patients who are:
  - a. Known to be previously VRE positive within the past 6-12 months.
  - b. Roommates exposed to VRE-positive patients.

NB: The accompanying requisition should request "VRE screen."

2. Sites to screen:
  - a. Peri-anal area.
  - b. Wounds and catheter exit sites.

### B. Microbiology Laboratory must

1. Notify the ward of positive VRE cultures.
2. Notify the Infection Control Practitioner (ICP) of all positive VRE cultures.

### C. Management of patients who are undergoing a VRE screen

2. A single room is not needed.
3. Maintain standard precautions and strict hand hygiene practices.
4. If patient is VRE positive, follow the management protocol outlined below.

**D. Management of VRE-positive patients**

1. Nursing
  - a. Request a single room with a bathroom from the Admission Office.
  - b. Initiate contact isolation precautions in addition to standard precautions.
    - i. Place a contact precautions sign on the outside of the room door.
    - ii. Maintain strict hand hygiene technique.
    - iii. Wear a gown and gloves when entering the patient's room.
    - iv. Cohort non-critical items such as thermometers and pressure cuffs with the patient.
    - v. Store a minimum amount of supplies in the patient's room.
    - vi. Use an isolation cart for extra supplies (outside the room).
  - c. Screen all patients who have shared a room with the VRE-positive patient for more than 48 hours for VRE.
  - d. Limit the patient's activities outside of the room/ward; refer to policy [ICM-III-09 \*Transporting Patients on Isolation Precautions\*](#).
  - e. Ensure concurrent and terminal cleaning of isolation room and equipment as per housekeeping procedure.
  - f. Handle/discard contaminated items as per Standard Precautions; refer to **policy [ICM-II-03 \*Standard Precautions\*](#)**.
  - g. Cohort nursing staff providing direct patient care.
  - h. Notify receiving departments/wards (e.g., Radiology, Endoscopy, Clinics, OR) of the patient's isolation status when the patient must be transported for treatment/tests. Refer to policy [ICM-III-09 \*Transporting Patients on Isolation Precautions\*](#).
  - i. Maintain contact isolation until infection control has been consulted regarding the discontinuation of isolation.
2. Medical
  - a. Seek Infectious Diseases Consultants as needed.
  - b. Be judicious with antibiotic use, especially that of vancomycin.
  - c. Discharge the patient if his/her medical condition allows.

**E. Discontinuation of contact isolation**

1. Discontinue isolation of VRE-positive patient after consultation with the ICP and the attending physician.
2. Criteria for discontinuing isolation
  - a. Three consecutive cultures (taken 3 days apart) from all previously positive sites and stool/peri-rectal swabs are all negative.
  - b. Patients should be off antibiotic therapy for a minimum of 48 hours prior to and throughout screening.

**F. Screening of HCWs and the environment**

1. Do not screen HCWs or the environment because it is not typically indicated and incurs unnecessary costs.
2. Consult the ICP before such measures are taken.

**G. Outbreak management**

Active surveillance will be coordinated by Infection Prevention & Control as needed and will require cooperation from Medical, Nursing, Laboratory, and other departments.

TITLE/DESCRIPTION: <b>HEPATITIS A VIRUS EXPOSURE MANAGEMENT</b>		INDEX NUMBER: <b>ICM – IV-04</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To describe the need for and the recommended prophylaxis for persons exposed to a confirmed case of Hepatitis A Virus (HAV).

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 81: Viral hepatitis. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP), May 2006:55(RR07);1-23
3. Red Book (2009). Report of the Committee on Infectious Diseases. The American Academy of Pediatrics
4. Update: Prevention of hepatitis A after exposure to hepatitis A virus and in international travelers. Updated recommendations of the Advisory Committee on Immunization Practices (ACIP), October 2007:56(41);1080-1084

## COMMENT

Post-exposure prophylaxis for HAV exposure on the part of unvaccinated contacts consists of a single Intramuscular (IM) dose of immunoglobulin (IG) or the Hepatitis A vaccine series.

## PROCEDURE

### A. Indications for post-exposure prophylaxis with immunoglobulin (IG) or Hepatitis A vaccine

1. Close personal contact  
IG or Hepatitis A vaccines should be administered to all household and sexual contacts of persons who have serologically confirmed Hepatitis A.
2. Daycare centers  
Immunoglobulin (IG) or Hepatitis A vaccines should be administered to all staff and attendees of daycare centers or homes if:
  - a. One or more cases of Hepatitis A are recognized in children or employees.
  - b. Cases are recognized in two or more households of center attendees.
3. Common-source exposure  
If a food handler is diagnosed with Hepatitis A, immunoglobulin or Hepatitis A vaccine should be administered to other food handlers at the same location. Since common-source transmission to patrons is unlikely, immunoglobulin or Hepatitis A vaccine administration to patrons is usually not recommended but may be considered if:
  - a. During the time the food handler was likely to be infectious, the food handler both directly handled uncooked foods or foods after cooking and had diarrhea or poor hygienic practices.
  - b. Patrons can be identified and treated within two weeks of the exposure.

In settings where repeated exposures to HAV may have occurred (e.g., institutional cafeterias), stronger consideration of immunoglobulin (IG) or Hepatitis A vaccine use may be warranted. In the event of a common-source outbreak, immunoglobulin (IG) should not be administered to exposed persons after cases have begun to occur because the two-week period during which the IG is effective will have been exceeded.

4. Schools, hospitals, and work settings

IG or Hepatitis A vaccination is not routinely indicated when a single case occurs in an elementary or secondary school, an office, or in other work settings and the source of infection is outside the school or work setting. Similarly, when a person who has Hepatitis A is admitted to a hospital, staff should not be routinely administered IG or Hepatitis A vaccines; instead, careful hygienic practices should be emphasized. Immunoglobulin (IG) or Hepatitis A vaccines should be administered to persons who have had close contact with index patients if an epidemiologic investigation indicates that HAV transmission has occurred among students in a school or between patients and staff in a hospital.

**B. Recommendations for post-exposure prophylaxis with immunoglobulin (IG) or Hepatitis A vaccine**

1. Persons who have recently been exposed to HAV and who previously have not received Hepatitis A vaccination should be administered a single dose of the single-antigen vaccine or IG (0.02 ml/kg) as soon as possible.
2. For healthy persons aged 12 months to 40 years, the single-antigen Hepatitis A vaccine is preferred to IG because of the advantages inherent to the vaccine.
3. For persons aged greater than 40 years, immunoglobulin (IG) is preferred because of the absence of information regarding vaccine performance and the more serious manifestations of Hepatitis A in this age group. The vaccine can be used if immunoglobulin (IG) is not available.
4. Immunoglobulin (IG) should be used for children less than 12 months of age, immunocompromised persons, persons diagnosed with chronic liver disease and persons for whom the vaccine is contraindicated.
5. Persons administered immunoglobulin (IG) for whom the Hepatitis A vaccine is also recommended for other reasons should receive a dose of the vaccine simultaneously with the immunoglobulin (IG) treatment.
6. The efficacy of immunoglobulin (IG) or vaccine when administered more than two weeks after exposure has not been established.

**C. Immunoglobulin dose and administration**

1. The index case must be serologically confirmed (i.e., positive for anti-HAV IgM).
2. Immunoglobulin (IG) at a 0.02 ml/kg single intramuscular (IM) dose should be administered as soon as possible, but no later than two weeks after the last exposure.

**D. Isolation precautions**

1. Practice standard precautions at all times.
2. Follow strict hand washing before and after entering the patient's room.
3. Place patients with HAV-related diarrhea on standard and contact precautions for the duration of the illness.

TITLE/DESCRIPTION: <b>VIRAL HEMORRHAGIC FEVER (VHF) MANAGEMENT</b>		INDEX NUMBER: <b>ICM – IV-05</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

The purpose of this policy is to provide clear guidelines for managing patients with suspected Viral Hemorrhagic Fever (VHF) in healthcare facilities whether sporadic or in an outbreak situation. This policy can be applied to the following agents that cause syndromes of VHF: Lassa, Marburg, Ebola, Congo-Crimean and Rift Valley hemorrhagic fever viruses.

## REFERENCE

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18: Isolation precautions. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 88: Viral hemorrhagic fevers. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)

## COMMENTS

The transmission of VHF has been associated with the reuse of contaminated or unsterilized needles and syringes, and with the exposure to virus-containing blood and body fluids (including vomitus, urine and stool) in the absence of appropriate barrier precautions.

The risk for person-to-person transmission of hemorrhagic fever viruses through the airborne route is highest during the latter stages of illness, which are characterized by vomiting, diarrhea, shock, and often hemorrhage. VHF infection has not been reported to occur during the incubation period.

The following recommendations apply to patients who within three weeks before onset of fever have either:

1. Traveled within the specific local area of a country where VHF has recently occurred.
2. Had direct contact with blood, body fluids, secretions, or excretions of a person or animal with VHF.
3. Worked in a laboratory or animal facility that handles hemorrhagic fever viruses.

## PROCEDURE

### A. Identifying an Isolation Unit

Each National Guard Institution should select an area, which can be utilized as an Isolation Unit.

The Isolation Unit should be able to function as a self contained closed unit with no movement of patients in or out. This should be done with the guidance of the Infection Control Department.

1. Admit the patient to an isolation room with negative pressure on an appropriate ward if a designated Isolation Unit is not available.
2. Admit seriously ill unstable patients to a negative pressure room in the ICU.

### **B. Emergency Department**

Most exposed or ill persons undergoing evaluation and transportation are in the early stages of disease and would not be expected to have symptoms that increase the likelihood of contact with infectious body fluids (e.g. vomiting, diarrhea, or hemorrhage). In such situations, standard precautions are generally sufficient.

If a patient has any of the above symptoms then respiratory and contact precautions are indicated in addition to standard precautions. Consult Infection Control Practitioner in addition to:

1. Following the disinfection / decontamination procedure as listed.
2. Admitting patient to a negative pressure single room or Isolation Unit if available.

### **C. Hospitalized Patients**

1. Require isolation in a single room/unit with an anteroom.
2. Use negative pressure rooms when available to avoid the need to transfer the patient later as the illness progresses.
3. Post the appropriate isolation signs outside the anteroom.
4. Use strict contact and standard precautions as well as hand hygiene practices that are vital to prevent exposure to body fluids and disease transmission.
5. Wear a N95 filter (TB mask) when in close contact with patients. If not available, a surgical mask should be used.
6. Keep all routine supplies for patient care outside of the isolation room.
7. Utilize isolation carts for extra supplies.
8. Keep containers with decontamination solutions in the anteroom.
9. Restrict visitation to only those considered essential.

### **D. Nursing / Medical**

1. Do not move patients in the isolation room/unit in or out unless absolutely necessary.
2. Do not interchange staff in this area with other areas in the hospital.
3. State clearly on the laboratory request form the proven or suspected diagnosis of VHF.
4. Apply standard precautions to prevent sharps injuries with appropriate disposal of needles and other sharp instruments.
5. Obtain clinical laboratory specimens using standard precautions.
6. Place specimens in leak-proof containers, then place in a sealed plastic bag and transport directly to the laboratory.
7. Staff working in that unit will be monitored by Employee Health Clinic (EHC) for contraction of the disease.
8. Nurse caring for a patient with VHF or suspected VHF should not have another assignment.
9. Place disposable material used for patient care or used by staff (gowns, gloves) in yellow garbage bags for incineration.
10. Place disposable items used in patient care areas (e.g. suction containers and catheters) in yellow bags for incineration.
11. Treat sewage and other fluids with household bleach, (5 minutes or longer) before flushing.
12. Flush only decontaminated fluids and sewage.
13. Contact CSSD regarding reusable instruments for cleaning and sterilization.

**E. Housekeeping**

1. Wear protective equipment when entering patients' room: mask, gown and gloves. (Discard in anteroom and wash hands before going to another room).
2. Use designated cleaning equipment (e.g. mops, paints, and wet vacuum) in the isolation room/unit.
3. Provide decontaminating solution, bleach or phenolic to nursing staff.
4. Clean all equipment and furniture upon patient discharge as per routine
5. Treat sewage and other fluids with household bleach, (5 minutes or longer) before flushing.
6. Flush only decontaminated fluids and sewage.
7. Use only yellow garbage bags in the isolation rooms.

**F. Laundry**

Refer to [ICM-VIII-02](#) *Laundry*.

**G. Notification Process**

The following notifications are mandatory if suspected cases of VHF are admitted:

1. The Admitting Consultant notifies the:
  - a. Infectious Diseases Consultant.
  - b. Nurse in charge of Emergency Department and Ward where patient is to be admitted.
2. The Infectious Diseases Consultant notifies the:
  - a. Chairman of the Infection Control Committee who will then notify the:
    - i. Medical Director
    - ii. Executive on Duty
    - iii. Infection Control Practitioner
3. The Nurse in charge of Emergency Department notifies the:
  - a. Nursing Supervisor or Duty Administrator
  - b. ICU Head Nurse if the patient is to be admitted to the ICU
4. The Chairman of Infection Control Committee notifies the:
  - a. Hospital Director
  - b. Laboratory and Radiology Departments
  - c. Employee Health Department
5. The Infection Control Practitioner notifies the:
  - a. Housekeeping Manager
  - b. CSSD Manager
  - c. Ministry of Health
  - d. Utilities and Maintenance for ventilation modification in patient rooms.
6. The Nursing Supervisor notifies the:
  - a. Director of Nursing
  - b. Nurse manager to consult on staffing.
  - c. Materials department for equipment for strict isolation.

**H. Management of exposure**

Persons with percutaneous or mucocutaneous exposures to blood, body fluids, secretions, or excretions from a patient with suspected VHF should immediately:

1. Wash the affected skin surfaces with soap and water. If desired an antiseptic solution may be used.
2. Irrigate mucous membranes (e.g., conjunctiva) with copious amounts of water or eyewash solution.

3. Report to Employee Health Clinic or ER (after hours) to receive medical evaluation and follow-up management.

#### **I. Management of the deceased**

Refer to [ICM-VIII-10](#) *Mortuary Care*

#### **J. Referrals**

Note: If concerns of suspected VHF are raised on a referred patient these steps should be followed:

1. Comply with standard precautions at all times.
2. Implement the following for patients presenting late in their illness (diarrhea, vomiting, or hemorrhage) and are being referred to other Hospitals:
  - a. Wear appropriate PPEs (mask, gown and gloves) when handling patient.
  - b. Prepare the patient for transport in an appropriate manner as to avoid contamination of HCW and surrounding with body fluids (e.g. mask and diapers).
  - c. Manage any soiled equipment or linen appropriately as detailed above.
3. Inform the receiving emergency ward by phone regarding the clinical condition of the patient being transferred.
4. The MRP, nurse in charge and registration clerk in the receiving hospital should be aware of the arrival of such patient/s in order to expedite and appropriately isolate the patient on arrival.

#### **K. Visitor**

Only essential visitors are allowed.

TITLE/DESCRIPTION: <b>PEDICULOSIS/SCABIES MANAGEMENT</b>		INDEX NUMBER: <b>ICM – IV-06</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines on the management of patients admitted with pediculosis or scabies.

## REFERENCE

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 18: Isolation precautions. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 92: Parasites. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)

## COMMENTS

1. Pediculosis is defined as any type of louse infestation. There are three types:
  - a. Pediculosis capitis – head lice
    - i. Head lice infestation of the hair, eyebrows and eyelashes is caused by *Pediculus humanus capitis*.
    - ii. Transmission is facilitated by direct contact with an infested person and/or objects used by them. Also, may be spread by indirect contact with the personal belongings of infested persons, especially shared clothing and headgear.
  - b. Pediculosis pubis – crab lice
    - i. Infestation is usually of the pubic area but in heavy cases may also be present in facial hair and eyelashes. Infestation of any type may result in severe itching, fever and excoriation of the scalp or body.
  - c. Pediculosis corporis – body lice
    - i. Infestation by body lice, *Pediculus humanus corporis*, is rarely found on the body, rather on the clothing of an infested person, especially along seams of the clothing's inner surfaces.
    - ii. Transmission is facilitated by direct contact with an infested person and/or objects used by them. Also, may be spread by indirect contact with the personal belongings of infested persons, especially shared clothing and headgear.
2. Scabies is a parasitic disease described as an infestation of the skin by the mite *Sarcoptes scabiei*.
  - a. Clinical manifestations of the disease include visible papules, vesicles, or tiny linear burrows that contain the mites and their eggs.
  - b. Lesions are prominent at the following sites: finger webs, flexor surfaces of the wrists and elbows, anterior axillary folds, thighs, external genitalia (men), nipples and abdomen (women). Affected areas also include the head, neck, palms and soles.
  - c. Transmission is primarily through direct, prolonged, skin-to-skin contact with an infected person, and it can occur even in the presence of high levels of personal hygiene.
3. Norwegian scabies syndrome is highly contagious.

## PROCEDURE

If a patient is suspected to be infested with any form of Pediculosis/scabies, examination of the patient will be conducted without delay by medical/nursing staff. The medical staff must verify the infestation before treatment can be initiated.

### A. Nursing

1. Isolate the patient in a single room with Contact Isolation precautions when suspicion or confirmation of scabies or lice infestation.
2. Obtain physician's confirmation and prescription for appropriate treatment.
3. Notify Infection control practitioner of patient's diagnosis.
4. Give patient clear instructions on proper use of the medication. Patient should be supervised to ensure correct application.
5. If assisting patient with treatment:
  - a. Put on the necessary (gown, gloves, and cap) protective personal equipment (PPE).
  - b. Prepare the patient for treatment.
  - c. Apply scabicide/pedulocide as per instructions (treatment details vary based upon the drug used).
  - d. Encourage the patient to leave the medication on for the time required for the specific product used.

NB: Pediculocides will not destroy all nits. Following application of the pediculocide, manual removal of the nits with a fine tooth comb, is crucial to preventing recurrence and pesticide resistance.

  - e. Give the patient (or encourage patient to take) a cleansing bath or shower to ensure proper rinsing of the scabicide.
6. Clothing and linen used by the infected patient from 3 days prior and 24 hours after treatment must be placed in a hot water soluble bag or double bagged, tied securely, labeled and sent to laundry.
7. All clothing and linen must be changed after the room has been thoroughly cleaned. See housekeeping instructions below.
8. All PPEs must be discarded in black bag and tied securely, immediately after use.
9. Continue isolation for 24 hours after effective treatment.

### B. Physician

1. A physician should assess the patient to determine the effectiveness of the treatment.
2. A single, proper application of treatment is curative in most cases and eliminates the risk of transmission.

### C. Housekeeping

Concurrent and terminal disinfection with hospital-approved disinfectant is recommended.

### D. Laundry

Isolate the laundry bag for special handling by the laundry facility.

- a. Linen and clothing should be placed in water-soluble laundry bags or labeled and transported to the laundry department.
- b. Linen and clothing should be washed at a temperature of 160°F (71°C) for at least 5 to 10 minutes.

### E. Household contact

Consult with the Public Health Nurse Coordinator in Infection Prevention and Control department for follow-up.

TITLE/DESCRIPTION: <b>RABIES EXPOSURE MANAGEMENT</b>		INDEX NUMBER: <b>ICM – IV-07</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines on pre-exposure prophylaxis for employees who work in the animal facility as well as guidelines on management of patients with exposure to possibly rabid animals.

## REFERENCES

1. Recommendations of the Immunization Practice Advisory Committee (ACIP). Human Rabies Prevention, United States (1999). *MMWR*, 8 January 1999:48;RR-1
2. Redbook (2006). Report of the Committee on Infectious Diseases. American Academy of Pediatrics (27<sup>th</sup> ed.)
3. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 89: Rabies. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)

## COMMENTS

1. The likelihood of rabies infection varies with the nature and extent of exposure, which may fall into one of two categories: bite and non-bite. Human-to-human transmission is rare. The virus is introduced into bite wounds, open cuts in the skin, or onto mucous membranes. Once it enters the central nervous system of the human, it causes encephalomyelitis, which is 100% fatal.
2. Types of exposure include:
  - a. Bite
    - i. Any penetration of the skin by teeth constitutes a bite exposure. All bites, regardless of location, represent a potential risk for rabies transmission. Bites by some animals such as bats can inflict minor injury and thus be undetected.
  - b. Non-bite
    - i. Non-bite exposures from terrestrial animals cause rabies and rarely require post-exposure prophylaxis.
    - ii. The non-bite exposure of highest risk appears to be among persons exposed to large amounts of aerosolized rabies virus.
    - iii. The contamination of open wounds, abrasions, mucous membranes, or (theoretically) scratches with saliva or other potentially infectious material (such as neural tissue) from a rabid animal also constitutes a non-bite exposure.
    - iv. Other contact, by itself, such as petting a rabid animal and contact with blood, urine, or feces (e.g., guano) of a rabid animal does not constitute an exposure and is NOT an indication for prophylaxis.
3. Human-to-human transmission
  - a. Human-to-human transmission has occurred among eight recipients of transplanted corneas. Stringent guidelines for acceptance of donor corneas have been implemented to reduce the risk.

## PROCEDURE

### A. Pre-exposure prophylaxis

*Pre-exposure prophylaxis is administered for several reasons:*

1. It simplifies therapy by eliminating the need for rabies immunoglobulin (RIG).
2. It decreases the number of doses of vaccine needed post exposure.
3. It may protect persons whose post-exposure therapy is delayed.
4. It may provide protection to persons at risk for unapparent exposure to rabies.

*Pre-exposure vaccination should be offered to:*

1. Persons in high-risk groups, such as veterinarians, animal handlers, and certain laboratory workers.
2. Persons whose activities bring them into frequent contact with the rabies virus or potentially rabid bats, raccoons, skunks, cats, dogs, or other species at risk for having rabies.
3. International travelers to areas where dog rabies is enzootic and immediate access to appropriate medical care, including biologics, may be limited.
4. Pre-exposure vaccine and dosage (see *Table 1*).

**Table 1. Rabies pre-exposure prophylaxis schedule**

Type of Vaccination	Route	Regimen
Primary cell culture rabies vaccine	Intramuscular (IM)	1 ml on days 0, 7, 28
	Intradermal (ID)	0.1 ml on days 0, 7, 28
Booster	Intramuscular	1 ml every 2 years
	Intradermal	0.1 ml every 2 years

NB: 1. For those travelers receiving anti-malaria prophylaxis, only the IM route should be used.  
2. Dosage may vary depending on the manufacturer; see package insert.

### B. Serological testing follow pre-exposure prophylaxis

Routine serologic testing to confirm seroconversion is not necessary except for persons suspected of being immunosuppressed or being in a high risk group.

### C. Post exposure therapy for previously vaccinated persons

Previously vaccinated persons should receive rabies vaccine as a booster. RIG is unnecessary and should not be administered to these persons.

### D. Post-exposure prophylaxis

The type of animal, circumstances of the biting incident and vaccination status of the animal affect the need for post-exposure prophylaxis

- a. An unprovoked attack by an animal is more likely than a provoked attack to indicate that the animal is rabid.
- b. Bites inflicted on a person attempting to feed or handle an apparently healthy animal should generally be regarded as provoked.
- c. A currently vaccinated dog, cat, or ferret is unlikely to become infected with rabies.

- d. A healthy domestic dog, cat, or ferret that bites a person may be confined and observed for 10 days. A veterinarian should evaluate any illness during confinement or before release. If signs suggestive of rabies develop during the observation period, the animal will be euthanized and its head removed and shipped under refrigeration for examination by the laboratory at the Regional Central Laboratory. Refer to policy [ICM-IV-08 Rabies Specimen Acquisition Handling and Shipment to Ministry of Agriculture Laboratory](#)
- e. If the biting animal is a stray or unwanted, it should either be observed for 10 days or be euthanized immediately and submitted for rabies examination (See Table 2).
- f. For handling of the animal head, refer to policy [ICM-IV-08 Rabies Specimen Acquisition Handling and Shipment to Ministry of Agriculture Laboratory](#).

**Table 2: Rabies post-exposure prophylaxis guide**

Animal Type	Evaluation and Disposition of Animal	Post-Exposure Prophylaxis Recommendations
Dogs, cats, and ferrets	Healthy and available for a 10-day observation  Rabid or suspected to be rabid Unknown (e.g., escaped)	Persons should not begin prophylaxis unless animal develops clinical signs of rabies.* Immediately vaccinate. Consult Infectious Diseases for advice.
Skunks, raccoons, foxes and most other carnivores, and bats	Regarded as rabid unless animal proven negative by laboratory tests**	Consider immediate vaccination.
Livestock, small rodents, lagomorphs (rabbits and hares), large rodents (woodchucks and beavers), and other mammals	Consider individually	Consult Infectious Diseases for advice. Bites of squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice, other small rodents, rabbits, and hares almost never require anti-rabies post-exposure prophylaxis.
Camels, sheep, and other livestock	Consider individually	Consult Infectious Diseases for advice.

\* During the 10-day observation period, begin post-exposure prophylaxis at the first sign of rabies in a dog, cat, or ferret that has bitten someone. If the animal exhibits clinical signs of rabies, it should be euthanized immediately and tested.

\*\* The animal should be euthanized and tested as soon as possible. Holding for observation is not recommended. Discontinue vaccine if immunofluorescence test results of the animal are negative.

**E. Wound management and vaccination**

- 1. Wound management
  - a. Wash all bite wounds and scratches immediately and thoroughly with soap, water and a virucidal agent such as povidone-iodine solution.
  - b. Persons who have been bitten by animals suspected or proven to be rabid should begin post-exposure prophylaxis immediately (See Table 3). Incubation periods of greater than one year have been reported in humans.
  - c. When a documented or likely exposure has occurred, post-exposure prophylaxis is indicated REGARDLESS of the length of delay of the clinical signs of rabies.
  - d. Tetanus prophylaxis and measures to control bacterial infection should be administered as indicated. The decision to suture large wounds is case dependent.
  - e. Post-exposure anti-rabies vaccination should always include the administration of both passive antibodies and vaccine. THE EXCEPTION to this rule is persons who have previously received complete vaccination regimens (pre-exposure and post-

exposure) with a cell culture vaccine or persons who have been vaccinated with other types of vaccines and have documented rabies antibody titers; these persons should receive the VACCINE ONLY (See Table 3).

**Table 3: Rabies post-exposure prophylaxis schedule**

Vaccination Status	Treatment	Regimen*
Not previously vaccinated	Wound cleansing	All post-exposure treatment should begin with immediate, thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as a povidone-iodine solution should be used to irrigate the wound(s).
	RIG*	Administer 20 IU/kg body weight. If anatomically feasible, the <i>full dose</i> should be infiltrated around the wound(s) and any remaining volume should be administered IM at an anatomical site distant from the vaccination site. Also, RIG should not be administered in the same syringe as the vaccine. Because RIG may partially suppress the active production of antibodies, no more than the recommended dose should be given.
	Rabies vaccine	Administer 1 ml IM or 0.1 ml ID in the deltoid area on days 0, 3, 7, 14 and 30. A booster dose on day 90 is optional.
Previously vaccinated**	Wound cleansing	All post-exposure treatment should begin with immediate, thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as a povidone-iodine solution should be used to irrigate the wounds.
	RIG	RIG should not be administered.
	Rabies vaccine	If vaccinated within one year: 1 ml IM or 0.1 ml ID on day 0. If vaccinated more than one year prior: 1 ml IM or 0.1 ml ID on days 0, 3, and 7.

\* These regimens are applicable for all age groups, including children.

\*\* Any person with a history of pre-exposure vaccination with HDCV, RVA, or PCED; prior post-exposure prophylaxis with HDCV, RVA, or PCEC; or previous vaccination with any other type of rabies vaccine and a documented history of antibody response to the prior vaccination.

2. Management of adverse reactions

- a. Once initiated, rabies prophylaxis should not be interrupted or discontinued because of local or mild systemic adverse reactions to the rabies vaccine.
- b. When a person with a history of hypersensitivity to the rabies vaccine must be revaccinated, antihistamines can be administered. Epinephrine should be readily available to counteract anaphylactic reactions, and the person should be observed carefully immediately after vaccination.

3. Precautions and contraindications

- a. Immunosuppression:
  - i. Corticosteroids, other immunosuppressive agents, anti-malarials, and immunosuppressive illnesses can interfere with the development of active immunity after vaccination. For such patients, pre-exposure prophylaxis should be administered with the awareness that the immune response might be inadequate.
  - ii. Persons who are immunosuppressed due to disease or medication should postpone pre-exposure vaccination and consider avoiding activities for which rabies pre-exposure prophylaxis is indicated. When this is not possible, persons who are immunosuppressed and at risk for rabies should be vaccinated by the IM route, and their antibody titers should be checked. Failure to seroconvert after the third dose should be managed in consultation with an Infectious Diseases Consultant.

- iii. Immunosuppressive agents should not be administered during post-exposure therapy unless they are essential for the treatment of other conditions.
  - b. Pregnancy:

Pregnancy is NOT considered a contraindication to post-exposure prophylaxis if the risk of rabies is substantial.
4. Investigation of contacts  
Search for other persons who may have been exposed to the infected animal.
5. Isolation of hospitalized patients  
Standard precautions are recommended for the duration of illness.
6. Confirmed rabies in patients is a reportable disease. Notify Infection Control.
7. Refer to policy [ICM-I-05](#) *Reporting Communicable Diseases to the Ministry of Health*.

TITLE/DESCRIPTION: <b>RABIES SPECIMEN ACQUISITION, HANDLING, AND SHIPMENT TO MINISTRY OF AGRICULTURE LABORATORY</b>		INDEX NUMBER: <b>ICM – IV-08</b>
EFFECTIVE DATE: <b>01/01/2009 01/10/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines on handling animal specimens involved in suspected rabies cases. These guidelines include instructions on acquiring, properly preserving and shipping the specimens to the Ministry of Agriculture Laboratory for testing.

## REFERENCE

Mandell G, Bennett J, and Dolin R. (2000). Rabies virus. *Principles and practice of infectious disease*. (5<sup>th</sup> ed., Chapter 51) Churchill Livingstone.

## COMMENT

Use standard precautions (wear gloves, aprons/gowns and masks) when handling the rabid/suspected animal/animal parts/animal specimens. Animal specimens should be double yellow bagged for handling.

## PROCEDURE

### A. Emergency Department

Notifies the Infection Prevention and Control Department

### B. Infection Prevention and Control Department

Contacts and coordinates with Environmental Services

### C. Pest Control

1. Captures and impounds the suspected rabid animal.
2. Decapitates the animal.
3. The animal's brain needs to be secured for testing by the Ministry of Agriculture Laboratory. The specimen should be packed and kept frozen in an appropriate insulated container.
4. The animal's body is to be double-bagged at all times. Take animal remains to the incinerator and make sure they are disposed of. Also, dispose of all PPE (gowns, gloves, mask, etc.).
5. Ship the specimen via overnight/same-day courier to the Ministry of Agriculture Laboratory.
6. Disinfect the area of the decapitation.

**\*Note:** Check the working hours of your country's Ministry of Agriculture Laboratory.

TITLE/DESCRIPTION: <b>MANAGEMENT OF PATIENTS WITH SUSPECTED SEVERE ACUTE RESPIRATORY SYNDROME (SARS)</b>		INDEX NUMBER: <b>ICM – IV-09</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To describe the institution's policy for the management of patients with suspected Severe Acute Respiratory Syndrome (SARS).

## REFERENCES

1. CDC (April 2003). Interim laboratory biosafety guidelines for handling and processing specimens associated with SARS.
2. *New England Journal of Medicine* 2003, 348:1947-48.
3. Specific country policies from the Ministry of Health (MOH)
4. World Health Organization (WHO) updated case definition.

## COMMENTS

1. Severe Acute Respiratory Syndrome is an emerging infectious disease associated with a novel corona virus that has caused worldwide outbreaks since 1<sup>st</sup> of November 2002.
2. The incubation period is 2 to 7 days and may extend to 10 days.
3. Case definition of SARS
  - a. Suspect case
    - i. A person presenting with a history of: high fever (>38°C) AND coughing or breathing difficulty AND one or more of the following exposures during the 10 days prior to onset of symptoms:
      - close contact with a person who is a suspected or probable SARS case
      - history of travel to an area with recent local transmission of SARS
      - residing in an area with recent local transmission of SARS
    - ii. A person with an unexplained acute respiratory illness resulting in death during a SARS outbreak, but on whom no autopsy has been performed AND one or more of the following exposures during the 10 days prior to onset of symptoms:
      - close contact with a person who is a suspected or probable case of SARS
      - history of travel to an area with recent local transmission of SARS
      - residing in an area with recent local transmission of SARS
  - b. Probable case
    - i. A suspected case with radiographic evidence of infiltrates consistent with pneumonia or respiratory distress syndrome (RDS) on chest X-ray (CXR).
    - ii. A suspected case with autopsy findings consistent with the pathology of RDS without an identifiable cause.
  - c. Confirmed case
    - i. A suspected case of SARS that is positive for SARS coronavirus by one or more assays. See [Use of laboratory methods for SARS diagnosis.](#)

4. Exclusion criteria
  - A case should be excluded if an alternative diagnosis can fully explain the illness.
5. Reclassification of cases
  - a. As SARS is currently a diagnosis of exclusion, the status of a reported case may change over time.
  - b. A case initially classified as suspected or probable, but for whom an alternative diagnosis can fully explain the illness, should be discarded.
  - c. A suspected case that, after investigation, fulfills the probable case definition should be reclassified as "probable."
  - d. A suspected case with a normal CXR should be treated as such and monitored for 7 days. Those cases for whom recovery is inadequate should be re-evaluated by CXR.
  - e. Those suspected cases for whom recovery is adequate but whose illness cannot be fully explained by an alternative diagnosis should remain as "suspected."
  - f. A suspect case who dies, but on whom no autopsy is conducted, should remain classified as "suspected." However, if this case is identified as being part of a transmission chain of SARS, the case should be reclassified as "probable."
  - g. If an autopsy is conducted and no pathological evidence of RDS is found, the case should be "discarded."

## **PROCEDURE**

### **A. Medical/nurses**

1. Notify the Infection Prevention and Control Department (IP&C) on weekdays and the designated personnel on call after office hours and on weekends.
2. Notify the Director of IP&C or designee in all cases.
3. Isolation of patients:
  - a. Place the patient in a negative pressure room in airborne isolation precautions.
  - b. Wear gloves, gown, N95 masks, and eye protection to enter the room and for contact with patient or any of his/her body fluids.
  - c. Wash hands carefully after removing gloves and other protective gear.
  - d. Limit the number of healthcare workers caring for the patient.
  - e. Limit the number of visitors.
4. Transport of suspected SARS patients:
  - a. Use the minimum number of Emergency Medical Staff (EMS). Wear appropriate PPE (the patient should wear a surgical mask; EMS should wear N95 masks).
  - b. Notify the receiving facility prior to transfer of suspected SARS patients to facilitate preparation for appropriate Infection Control procedures and facilities.

### **B. Laboratory Testing**

1. Only critical samples should be sent for investigation. Required tests should be discussed with the Infectious Disease Consultants on call.
2. All samples should be hand delivered to the appropriate laboratory section.
3. Arrange for sample transport to specific healthcare laboratory and for subsequent transfer of other samples to be tested by the Ministry of Health.
4. Follow the guidelines for the "Handling of Possible or Suspected SARS Specimens" in the microbiology laboratory.
5. Assessment of laboratory results and disposition of the patient will be determined by the Infectious Diseases Consultants in coordination with IP&C.

TITLE/DESCRIPTION: <b>RAPID MRSA SURVEILLANCE</b>		INDEX NUMBER: <b>ICM – IV-10</b>
EFFECTIVE DATE: <b>01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

This policy describes the procedure for rapid evaluation of initial Methicillin-Resistant *Staphylococcus aureus* (MRSA) screening (surveillance) of patients for admission, to identify those patients requiring isolation, thus reducing or preventing the spread of MRSA to HCWs, patients and visitors.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 70: Staphylococcus. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. APIC Guide to the elimination of methicillin-resistant staphylococcus *aureus* (MRSA) transmission in hospital settings, March 2007

## COMMENTS

1. MRSA refers to strains of *Staphylococcus aureus* that are resistant to oxacillin and other  $\beta$ -lactam antibiotics.
2. Concerns about MRSA are related to the potential for nosocomial transmission and the limited number of antibiotics available to treat infections caused by this organism.
3. Initiate empiric contact isolation precautions during the screening process.
4. STANDARD PRECAUTIONS MUST BE OBSERVED FOR ALL PATIENT CARE.
5. Patients admitted from the Emergency Department who meet the criteria for MRSA screening can be transferred to a ward in contact isolation.

## PROCEDURE

### A. Patients who require MRSA surveillance screening may include:

1. Patients admitted to the intensive care unit
2. Patients transferred from other hospitals or patients treated at another hospital/clinic within the past six months
3. Exposed roommates of new MRSA-positive patients
4. Patients undergoing liver or cardiac surgery, organ transplant, continuous ambulatory peritoneal dialysis, or orthopedic prosthesis placement surgery

### B. Nasal swab for rapid screening

1. Use the red-top tube with double-tip dry culture swab for anterior nares.
2. Write "MRSA SURVEILLANCE SAMPLE" on requisition.
3. All swabs should be transported as soon as possible to the Microbiology Lab.

**C. Microbiology laboratory**

1. The Microbiology Lab will run tests on specimen in batches.
2. All swabs will be tested using the rapid test system, and results will be reported in the following manner:
  - a. All negative results will be released in 24 hours
  - b. Positive results will be phoned to the Ward and the Infection Control Department

**D. Management of MRSA-positive patients**

Nursing – Refer to policy [ICM-IV-02](#) *Methicillin-Resistant Staphylococcus Aureus Management*

## Section 5: POLICIES RELATED TO TUBERCULOSIS

<b>Section</b>	<b>Title</b>	<b>Page #</b>
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TITLE/DESCRIPTION: <b>TUBERCULIN SKIN TESTING: ADMINISTRATION AND INTERPRETATION</b>		INDEX NUMBER: <b>ICM – V-01</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To describe the procedure on how to administer and interpret the Mantoux tuberculin skin test (TST) used to diagnose of latent tuberculosis infection (LTBI) for pre-employment purposes and as part of post-exposure evaluation of employees.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 26: Occupational health. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 91: Mycobacteria. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
3. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 109: The pregnant healthcare worker. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
4. Centers for Disease Control and Prevention (CDC). For edition U.S. Public Health Service guidelines for TB care guide highlights from core curriculum on tuberculosis: what the clinician should know, 2000.
5. Centers for Disease Control and Prevention (CDC). Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR*, 2000; 49 (NO RR-6).
6. Centers for Disease Control and Prevention (CDC) Divisions of Tuberculosis Elimination. Targeted tuberculin testing and treatment of latent tuberculosis infection, 2005.

## COMMENTS

TST testing is used for:

1. Persons at high risk for TB exposure or infection.
2. Persons at high risk for TB disease once infected.
3. To identify infections in asymptomatic persons.
4. To establish baseline TST results for all new employees.

## PROCEDURE

### A. Pretest counseling

1. Counsel any employee or patient identified as needing a PPD test regarding:
  - a. The indication(s) for testing.
  - b. The importance of early detection of TB infection.
  - c. The risks of TB infection and active disease.
  - d. The importance of returning for reading the TST test within the specified time frame.
  - e. What a positive and negative test result could indicate.
  - f. How to care for the test site.

**B. Pre-employment screening**

1. Question candidates regarding past positive test results prior to the actual planting of the TST.
2. Exclude persons who have had the following from testing:
  - a. Live vaccine administered within the past 3 weeks or on the same day as the TST because live-virus vaccines may cause a false negative reaction.
  - b. Current febrile illness.
  - c. Small pox vaccination within the past month.
  - d. Exclude those with a documented positive PPD.

**C. Pre-employment procedure**

All new hires undergo baseline TSTs. The procedure is as follows:

***Testing for Latent TB Infection***

1. The Tuberculin Skin Test (TST) detects individuals infected with *Mycobacterium tuberculosis*. The skin test is administered intradermally using the Mantoux technique by injecting 1.0 ml containing 5 TU of purified protein derivative (PPD) solution. If a person is infected, a delayed-type hypersensitivity reaction is detectable 2 to 8 weeks after infection. The reading and interpretation of TST reactions should be conducted within 48 to 72 hours of administration by trained healthcare professionals.
2. Equipment and materials  
1 cc tuberculin syringe, 26- or 27-gauge needle, ½ inch (16 mm) long, alcohol swabs and a measuring tool marked in millimeters.
3. Administration  
The Mantoux test is the recommended TST. It is administered by injecting 1.0 ml containing 5 TU of purified protein derivative (PPD) solution intradermally into the volar surface of the forearm using a 27-gauge needle with a tuberculin syringe.
  - a. Obtain results of all previous TSTs. Ask the patient to describe what the test area looked like 2 to 3 days after administration; obtain documentation.
  - b. Avoid areas of skin with veins, rashes, or excess hair.
  - c. Cleanse hands with alcohol hand rub.
  - d. Cleanse the area with an alcohol swab, allowing the area to dry.
  - e. Clean the rubber top of vial before drawing up solution.
  - f. Inject all of the antigen just below the surface of the skin on the volar surface of the forearm, forming a 6-10 mm wheal (a pale, raised area with distinct edges; has orange peel-like appearance and does not disappear immediately).
  - g. Avoid covering the area with a bandage or applying pressure to the injection site.
  - h. If minor bleeding occurs, dab the injection site with a cotton swab.
  - i. If no wheal forms, or if a wheal forms that is less than 6 mm, the test should be repeated immediately, approximately 2 inches from the original site or on the other arm.
  - j. Record the date, time, and location of the TST.
  - k. Instruct the patient not to scratch the site but to use a cool compress to relieve any itching or swelling.
  - l. Give a written appointment card for TST reading. Inform the patient of the importance of returning for a reading of the TST within 48 to 72 hours (2 to 3 days).
  - m. Provide written information about the TST (a pamphlet or brochure).

4. Measurement
  - a. Measure the induration (hard bump) rather than the erythema.
  - b. Palpate the area with the fingertips, measuring the diameter of induration perpendicular to the long axis of the arm.
  - c. Use a ballpoint pen to mark the edges of the induration.
  - d. Use a tuberculin skin test ruler or a ruler with millimeter marks to measure the distance between the two points.
5. Recording and documentation
  - a. Record the date that the TST was administered.
  - b. Record the brand name of the PPD solution, lot number, manufacturer, and expiration date in the patient's records.
  - c. Record results in millimeters of induration (0 mm if there is no induration) rather than as positive or negative.
  - d. Record the date and time of reading and the name of the person reading the TST.
  - e. Provide the patient and ordering physician with written documentation.
6. Storage and handling
  - a. PPD solution must be kept refrigerated at 36–46°F.
  - b. Avoid fluctuations in temperature; do not store in the refrigerator door.
  - c. Syringes must be filled immediately prior to administration.
  - d. Store and transport the tuberculin in the dark as much as possible and avoid exposure to light.
7. Key points
  - a. The TST should not be performed on a person who has a documented history of either a positive TST result or treatment for TB disease.
  - b. TST results should only be read and interpreted by a trained healthcare professional. Patients or family members should not be relied upon to measure TST results.
  - c. TB disease must be ruled out before initiating treatment for LTBI to prevent inadequate treatment of TB disease.
8. Classification of Tuberculin Skin Test Reactions (*Tables 1 to 3*)

**Table 1: A TST reaction of  $\geq 5$  mm of induration is considered positive in:**

1. HIV-infected persons
2. Recent contacts of infectious TB cases
3. Persons with fibrotic changes on chest radiograph consistent with prior TB
4. Organ transplant recipients
5. Those who are immunosuppressed for other reasons (taking an equivalent of  $\geq 15$  mg/day of prednisone for 1 month or more or taking TNF- $\alpha$  antagonists)

**Table 2: A tuberculin skin test reaction of  $\geq 15$  mm of induration is considered positive in:**

1. Persons with no risk factors for TB

**Table 3: A TST reaction of  $\geq 10$  mm of induration is considered positive in:**

1. Recent immigrants (within last 5 years) from high-prevalence countries
2. Injection drug users
3. Residents or employees of high-risk congregated settings (prisons, jails, long-term care facilities for the elderly, hospitals and other healthcare facilities, residential facilities for patients with AIDS, and homeless shelters)
4. Mycobacteriology laboratory personnel
5. Persons with the clinical conditions previously mentioned
6. Children younger than 4 years of age
7. Infants, children, or adolescents exposed to adults at high risk for TB disease

9. Chest Radiograph
  - a. Chest radiographs help differentiate between LTBI and pulmonary TB disease in individuals with positive TST results.

**D. For TST-positive individuals**

1. Clinical evaluation to exclude active tuberculosis
  - a. Order chest radiography as part of a medical evaluation for a person who has a positive TST.
  - b. Determine baseline CBC and LFT.
2. Refer to the primary care consultant for evaluation and possible prophylaxis. After baseline testing, routine periodic retesting is recommended for persons who had abnormal initial results and other persons at risk for hepatic disease.
3. At any time during treatment, whether or not baseline tests were done, laboratory testing is recommended for patients who have symptoms suggestive of hepatitis (e.g., fatigue, weakness, malaise, anorexia, nausea, vomiting, abdominal pain, pale stools, dark urine, and chills) or those who have signs of jaundice. Patients should be instructed at the start of treatment and at each monthly visit to stop taking treatment and to seek medical attention immediately if symptoms of hepatitis develop and not to wait until a clinic visit to stop treatment.
4. **Special Considerations during Pregnancy**
  - a. Consider immediate treatment for LTBI if the woman is HIV-infected or has had recent contact with a TB case and monitor the patient.
  - b. In the absence of risk factors, wait until after the woman has delivered to avoid administering unnecessary medication during pregnancy.
  - c. INH administered daily is the preferred regimen.
  - d. Supplementation with 50 mg pyridoxine (vitamin B6) is recommended.

**Table 4: Treatment Regimens**

Isoniazid	Adult: 5 mg/kg Children: 10-20 mg/kg Maximum dose: 300 mg	Daily x 9 months
<b>Or</b>		
Rifampin	Adults: 10 mg/kg Children: 10-20 mg/kg Maximum dose: 600 mg	Daily x 4 months

TITLE/DESCRIPTION: <b>CONTACT TRACING, SCREENING, AND TREATMENT OF TUBERCULOSIS IN HEALTHCARE WORKERS</b>		INDEX NUMBER: <b>ICM – V-02</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide a clear policy for contact tracing, screening, and treatment of healthcare workers exposed to *Mycobacterium tuberculosis*.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 26: Occupational health. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 91: Mycobacteria. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
3. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 109: The pregnant healthcare worker. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
4. Centers for Disease Control and Prevention (CDC). For edition U.S. Public Health Service guidelines for TB care guide highlights from core curriculum on tuberculosis: what the clinician should know, 2000.
5. Centers for Disease Control and Prevention (CDC). Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR*, 2000; 49 (NO RR-6).
6. Centers for Disease Control and Prevention (CDC). Update: Fatal and severe liver injuries associated with Rifampin and Pyrazinamide for latent tuberculosis infection. Revisions in American Thoracic Society/CDC Recommendations, 2001: 5(34).

## COMMENTS

1. All employees must comply with the Employee Health tuberculosis screening program.
2. A close contact is defined as someone who has been in contact with an infectious TB patient for at least 30 to 40 minutes without wearing a mask.
3. All employees must report to the Employee Health Clinic or designated department if they have any symptoms suggestive of tuberculosis infection (cough  $\geq 3$  weeks in duration, especially in the presence of weight loss, night sweats, haemoptysis, anorexia or fever) or if they have experienced exposure to smear-positive patients.
4. Exclude those with a documented positive PPD test from further PPD testing.

## PROCEDURE

### A. For contact tracing

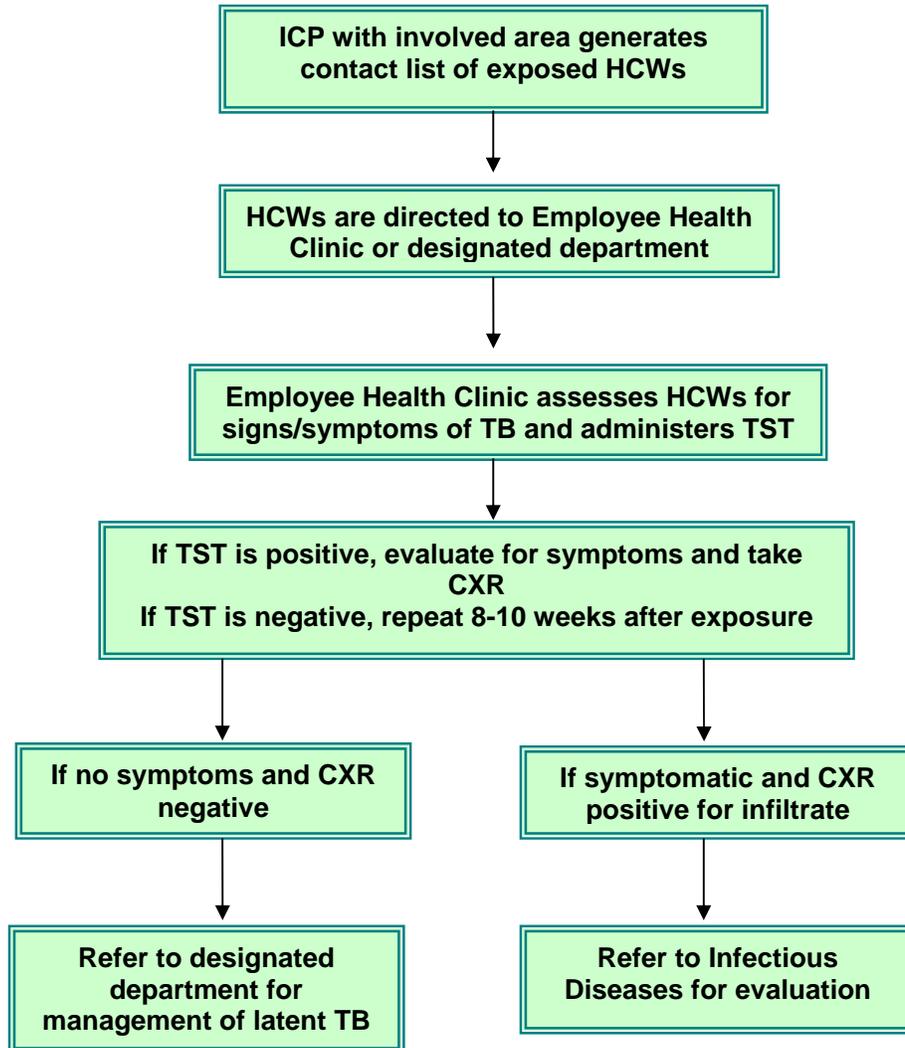
The Infection Prevention & Control (IP&C) department will initiate contact tracing as needed. Contacts are those with recent or prolonged exposure to a person with known or suspected infectious TB (i.e., pulmonary or laryngeal TB with a positive sputum smear). They should be evaluated immediately for TB disease and LTBI. If the TST is positive, the guidelines listed above should be followed. Those who have negative TST reactions should be retested in 8 to 10 weeks. TST conversion definition:  $\geq 10$  mm increase in the size of the TST induration over a 2-year period in a HCW with a documented negative ( $< 10$  mm) baseline.

1. Once notified, the Infection Control Department is responsible for identifying any exposed HCWs.
2. A list of the exposed staff with their respective medical record numbers (MRNs) is forwarded to the Employee Health clinic or designated department.
3. HCW's chart is reviewed for documentation of either a positive TST or previous INH therapy for the exposed staff.
4. Those who had previously documented positive TSTs or a history of INH prophylaxis are evaluated by surveillance clinic physicians to rule out active TB and counseled to report any signs and symptoms of tuberculosis.
5. The remaining staff members undergo TSTs.
6. Those who test positive are referred to their primary care consultants for evaluation.
7. Those who test negative are required to retest 8 to 10 weeks after exposure.
  - a. HCWs who test TST-positive are again referred to their primary care consultants for evaluation.
8. Staff with negative TSTs are discharged.
  - a. In general, TST-positive contacts with a documented history of prior adequate treatment for LTBI do not need to be re-treated. Re-treatment may be indicated for persons at high risk of becoming re-infected and progressing to TB disease (e.g., immunocompromised persons).
  - b. The patient should receive documentation of the TST results and treatment completion, including name, dates, chest radiograph, and dosage and duration of medication. The patient should be instructed that he or she should present this document any time future testing is required.
  - c. Patient should be re-educated about the signs and symptoms of TB disease and told to contact his or her medical provider if he or she develops any of these signs or symptoms.
  - d. Regardless of whether the patient completes the treatment for LTBI, serial or repeated chest radiographs are not indicated unless the patient develops signs or symptoms suggestive of TB disease.

### B. TST Administration and interpretation

1. Refer to policy [ICM-V-01 Tuberculin Skin Testing: Administration and Interpretation](#).
2. Refer to [Flowchart 1 – V-02, Screening HCWs for TB](#), page 107.

Flowchart 1-V-02:  
Screening Healthcare Workers for TB



TITLE/DESCRIPTION: <b>MANAGEMENT OF SUSPECTED/CONFIRMED CASES OF INFECTIOUS TUBERCULOSIS</b>		INDEX NUMBER: <b>ICM – V-03</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To outline the steps to be taken when admitting patients with suspected/confirmed infectious tuberculosis (TB) from the Emergency Room or Ambulatory Care area as well as during their subsequent management.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 91: Mycobacteria. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Centers for Disease Control and Prevention (CDC). Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Healthcare Settings. *MMWR*. 2005
3. Centers for Disease Control and Prevention (CDC). Control of tuberculosis in the United States. *American Thoracic Society*. 1992: 146; 1623-1633.
4. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007

## COMMENTS

1. Risk factors for tuberculosis:
  - a. Living in an area endemic for TB.
  - b. History of incarceration or IV drug use.
  - c. History of exposure to tuberculosis.
  - d. History of untreated or inadequately treated tuberculosis.
  - e. HIV infection.
  - f. Advanced age or age less than 4 years.
2. For confirmed cases of infectious tuberculosis, an N95 TB mask should be utilized. A surgical mask is sufficient in suspected cases of TB. Once the diagnosis of infectious tuberculosis is made, an N95 mask should be used.

## PROCEDURE

### A. The triage process in the Emergency Room and the Ambulatory Care area

1. HCWs who are the first point of contact in facilities that serve populations at risk for TB should be trained to ask questions that will facilitate the identification of patients with signs and symptoms suggestive of TB.
2. Identify patients who are suspected or confirmed to have pulmonary TB at the time of triage.
  - a. Promptly evaluate patients with signs or symptoms suggestive of TB to minimize the amount of time spent in the Emergency Room or Ambulatory Care areas.

3. Follow airborne precautions while the diagnostic evaluation is being conducted for these patients:
  - a. Place these patients in a separate area apart from other patients, ideally a negative pressure room (AIIR) and not in open waiting areas.
  - b. In the absence of an AIIR, a single room with a door can be used *temporarily*.
    - i. Provide the patient with surgical masks and instruct him/her on how to use them.
  - c. Instruct patients, family and sitters about the importance of such precautions.
  - d. Educate patients on cough etiquette and respiratory hygiene.

**NB:** AIIR room(s) should be available in the ambulatory care setting where patients with TB are frequently examined or treated.

#### **B. The admission process**

1. Place a mask on any patient with suspected or confirmed infectious tuberculosis and admit him/her to a negative pressure isolation room. See comments for the types of masks to use.
2. Perform a chest X-ray to rule out the presence of cavitory lesions, which are indicative of infectivity.
  - a. If the chest X-ray is normal and the patient has a normal immune system, precautionary measures should be discontinued.
  - b. If the chest X-ray is abnormal, 3 sputum specimens should be collected over 8 to 24 hours (one must be an early morning specimen) and sent for AFB testing.

#### **C. Isolation precautions for admitted patients**

1. Place the patient in a single AIIR (negative pressure room).
2. Keep the patient in his/her room at all times. If the patient must leave the room, he/she must wear a mask; see comments for the type of mask to use.
3. Ensure that doors and windows are closed at all times to maintain negative pressure.
4. Limit the number of individuals entering the room.
5. HCWs must wear an N95 filter mask prior to entering the room.
6. Educate HCWs and visitors regarding the importance of adherence to these policies.

#### **D. Patient transport**

1. The transport of confirmed cases should be kept to an absolute minimum.
2. Keep the patient in the room during the infectious period (if patient is to be transported refer to policy [ICM-III-09](#) *Transporting Patients on Isolation Precautions*).
  - a. Place a surgical mask on the patient if he/she is to leave the room.
  - b. Limit the transport of patients to essential medical purposes.

#### **E. Discontinuation of isolation precautions**

1. Isolation precautions can be discontinued when active disease has been ruled out.
2. A patient diagnosed with active disease must be on adequate therapy, recovering clinically, and have 3 negative AFB sputum samples (3 sputum specimens collected over 8 to 24 hours; one must be an early morning specimen).

**NB:**

- Consult with the ICP prior to discontinuing isolation.
- If there is a high clinical suspicion of TB, the patient must remain in isolation even if 3 sputum samples are AFB smear negative.

TITLE/DESCRIPTION: <b>MANAGEMENT OF PATIENTS WITH INFECTIOUS TUBERCULOSIS IN THE OPERATING ROOM</b>		INDEX NUMBER: <b>ICM – V-04</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To describe precautionary measures needed to be taken when surgical procedures are being performed on infectious tuberculosis patients.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 91: Mycobacteria. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Centers for Disease Control and Prevention (CDC). Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Healthcare Settings MMWR. 2005
3. Centers for Disease Control and Prevention (CDC). Control of tuberculosis in the United States. *American Thoracic Society*. 1992: 146; 1623-1633.
4. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007

## COMMENTS

1. Elective operative procedures on patients who have TB should be delayed until the patient is no longer infectious.
2. Communication and screening systems should be in place so that Operating Room (OR) personnel are aware of or informed about the infectious status of the patient before arriving in the OR.

## PROCEDURE

### Operating room

1. If possible, perform procedures in operating rooms that have anterooms. For operating rooms without anterooms, the doors to the operating room should be closed, and traffic into and out of the room should be minimal to reduce the frequency of opening and closing the door. Attempts should be made to perform the procedure at a time when other patients are not present in the operative suite and when the minimum number of personnel are present (e.g., at the end of the day).
2. OR personnel should wear N95 masks throughout the procedure.
3. Place a bacterial filter on the patient's endotracheal tube. For those with documented active pulmonary TB, this filter will help reduce the risk of contaminating the anesthesia equipment. The entire circuit should be changed after the surgery is completed.
4. Let the patient recover in the operating room, if a negative pressure room is not available, or alternatively, in a private room with a portable HEPA filter.

TITLE/DESCRIPTION: <b>TRACING CONTACTS OF INFECTIOUS TUBERCULOSIS PATIENTS OTHER THAN HEALTHCARE WORKERS</b>		INDEX NUMBER: <b>ICM – V-05</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To outline the process for investigating and screening exposed contacts (non-HCWs) of infectious tuberculosis patients.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 91: Mycobacteria. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Centers for Disease Control and Prevention (CDC). Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Healthcare Settings MMWR. 2005
3. Centers for Disease Control and Prevention (CDC). Control of tuberculosis in the United States. *American Thoracic Society*. 1992: 146; 1623-1633.
4. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007

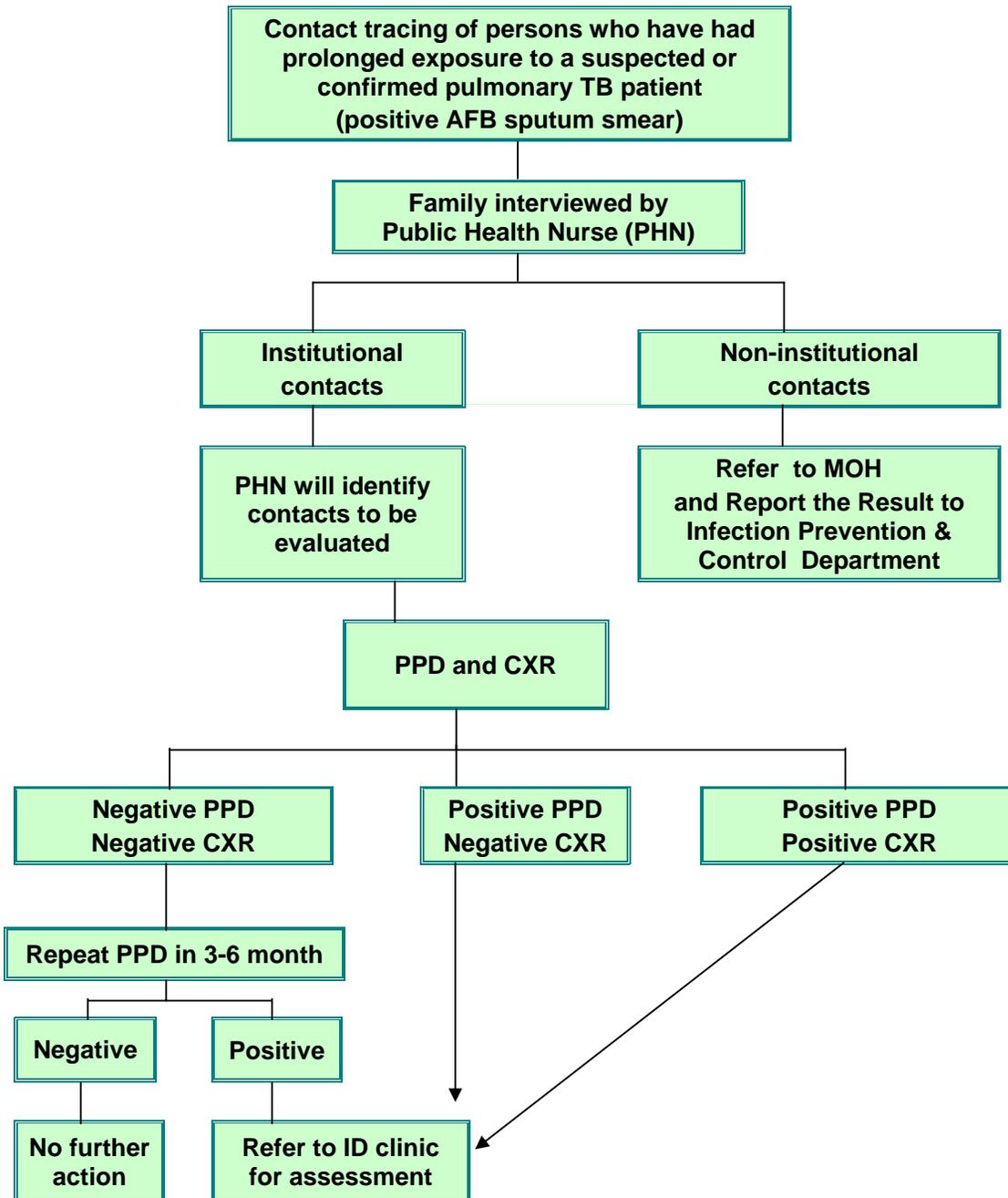
## COMMENTS

1. All persons who are close contacts of a presumed or confirmed infectious tuberculosis cases will be investigated for possible contraction of the disease.
2. A close contact is defined as one who has been in contact with an infectious TB person for at least 30-40 min without wearing a mask and/ or living in the same household.
3. The Public Health Nurse will refer all other close contacts of an index case to the infectious diseases clinic for evaluation.
4. The Public Health Nurse will provide education regarding the disease and therapy.
5. Healthcare workers whom might be contacts of an infectious TB case will be followed up by the Infection Control staff who will then refer them to the Employee Health Clinic or designated department for evaluation.

## PROCEDURE

1. Refer to [Flowchart 1–V-05](#) *Contact tracing of TB patients* page 112.
2. Refer to [ICM–V-02](#) *Contact Tracing, Screening, and Treatment of Tuberculosis in Healthcare Workers*.

Flowchart 1-V-05: Contact Tracing of TB Patients



Abbreviations	
HCW	- Healthcare Worker
ID	- Infectious Disease
MOH	- Ministry of Health
PHN	- Public Health Nurse
PPD	- Purified Protein Derivative

## Section 6: EMPLOYEE AND OCCUPATIONAL HEALTH POLICIES

<b>Section</b>	<b>Title</b>	<b>Page #</b>
ICM - VI-01	<b>Employee Occupational Health Program</b>	<b>115</b>
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TITLE/DESCRIPTION: <b>EMPLOYEE OCCUPATIONAL HEALTH PROGRAM</b>		INDEX NUMBER: <b>ICM – VI-01</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

All healthcare workers (HCWs) are at risk of exposure to an environment in which the potential of an unknown infection hazard always exists.

## COMMENTS

The definition of an employee will significantly influence the eligibility of persons for medical assessment and care in the Employee Health Service. Volunteers, casual staff and contract trades people are not usually considered employees. However, there are situations in which such persons are included in the Employee/Occupational Health programs for infection prevention and control purposes.

## PROCEDURE

1. Assist in the prevention and control of occupationally acquired infections and hazards, particularly those related to hospital work.
2. Identify any infection risk related to employment and institute appropriate preventive measures.
3. Assess and determine the immune status and immunization requirements of employees for vaccine-preventable diseases and institute the appropriate measures.
4. Assist administration in the hiring and/or assigning of employees to work that is suitable to the employees' capabilities.
5. Provide treatment and medical advice to individual employees and act as a resource for employees to obtain care.
6. Monitor and investigate infectious diseases, potentially harmful infectious exposures and outbreaks of infections among HCWs.
7. Establish and maintain accurate and confidential medical records of employees.
8. Assist in the provision of a safe working environment for patients and staff.

<b>TITLE/DESCRIPTION:</b>		<b>INDEX NUMBER:</b>
<b>PRE-EMPLOYMENT ASSESSMENT</b>		<b>ICM – VI-02</b>
<b>EFFECTIVE DATE:</b>	<b>APPLIES TO:</b>	<b>ISSUING AUTHORITY:</b>
01/01/2009 01/01/2013	All GCC Countries	GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)

## DEFINITION

The pre-employment history and assessment provides the basis of pre-employment evaluation for all Health Facilities employees.

## REFERENCES

1. Saudi Arabia Ministry of Health Circular 19/83026 dated 4-11-1429H
2. Refer to specific hospital policies on HIV Policy for Employees
3. Refer to specific hospital policies on International Recruitment Process
4. Refer to specific hospital policies on Local Recruitment Process

## COMMENTS

Exceptional circumstances may allow some potential employees to start work before the completion of all medical assessments. However, continued employment or recontracting is dependent on the successful completion of all necessary tests.

## PROCEDURE

1. Recruiters will advise and instruct all potential employees of the pre-employment medical requirements.
2. The employee will be given a pre-employment package that depends on the status of hiring (i.e., international hire, local hire, or locum position).
3. Depending on the hospital policies, it is recommended that upon arrival, all employees shall have repeat testing for HIV, Hepatitis B (HBV), Hepatitis C (HCV), Hepatitis A (HAV), rubella IgG, measles IgG, varicella IgG and syphilis. In addition, any missing tests that are required will be performed at that time.
4. All employees shall have a baseline TB Quantiferon (TBQ)/PPD test.
5. All potential employees must fill out the pre-employment form with the assistance of a medical doctor.
6. All potential employees must fulfill the requirements outlined on the pre-employment physical form.
7. Details of the employee's medical results and final clearance will be documented.
8. The completed pre-employment history form, the physical form, and the official (original) copies of laboratory and other test reports will form the basis of a medical record chart for each employee.
9. All newly recruited employees will commence Clinical Service (issuing their badges) only after clearance from the Infection Prevention and Control Department.
10. The Head of the Infection Prevention & Control department shall verify the clearance letter of all newly hired staff in their respective departments prior to scheduling any clinical responsibility; otherwise, the department will be held accountable.
11. Employees arriving from Ethiopia, Eritrea, Kenya, Somalia, Djibouti, Thailand, Vietnam, Sudan, Nepal, and South Africa shall have, in addition to the above, yearly HIV testing as a requirement for recontracting or continuing work.

TITLE/DESCRIPTION: <b>IMMUNIZATION GUIDELINES FOR HEALTHCARE WORKERS</b>		INDEX NUMBER: <b>ICM – VI-03</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

Outlines recommended vaccinations for healthcare workers (HCWs) at any GCC-CIC facility.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 107: Immunization in the healthcare worker. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Hospital Infection Control Practices Advisory Committee (HICPAC). (December 2006). Immunization of healthcare workers: recommendations of the Advisory Committee on Immunization Practices (ACIP). 55:(RR-15).

## COMMENTS

1. Optimal vaccination of HCWs can prevent the transmission of certain diseases, and prevention is more cost effective than case management and outbreak control.
2. All live vaccines should be given on the same day or separated by at least 1 month.
3. In addition to immunization, all HCWs should be oriented regarding:
  - a. Hand hygiene.
  - b. Modes of disease transmission.
  - c. The importance of presenting themselves to employee health when they suspect an infectious disease may be present (e.g., rash, fever).
  - d. TB control measures.
  - e. The importance of cooperating with the Infection Prevention and Control Department.
  - f. The importance of complying with standard precautions.
  - g. The importance of screening and immunization.

## PROCEDURE

Refer to [Table 1–VI-03](#), *Routine immunizations recommended for healthcare personnel*.

Refer to [Table 2–VI-03](#), *Immunizations recommended for healthcare personnel in special circumstances*.

Table 1-VI-03  
 Routine immunizations recommended for healthcare personnel

Generic name	Primary booster dose schedule	Indications	Major precautions and contraindications	Special considerations
<b>Hepatitis B recombinant vaccine</b>	<ol style="list-style-type: none"> <li>1. Give IM</li> <li>2. Give 3-dose series (1<sup>st</sup> dose immediately, 2<sup>nd</sup> dose in 1 month, 3<sup>rd</sup> dose 5 months after 2<sup>nd</sup> dose)</li> <li>3. Obtain anti-HBs serological testing 1-2 months after 3<sup>rd</sup> dose</li> </ol>	HCWs at risk of exposure to blood and body fluids	<p><u>Precautions</u> Moderate or severe acute illness, with or without fever</p> <p><u>History of</u> anaphylactic reaction to common baker's yeast</p> <p><u>Contraindication</u> Severe allergic reaction after a previous dose or to any vaccine component. Not contraindicated in pregnancy and may be administered to a pregnant woman who is eligible for it.</p>	HCWs who have ongoing contact with blood and body fluids should be tested 1-2 months after completing the vaccination series to determine serologic response.
<b>Influenza vaccine</b>	One dose of trivalent influenza vaccine (TIV) annually.	All HCWs	<p><u>Precautions</u> Moderate or severe acute illness, with or without fever.</p> <p><u>History of</u> Guillain-Barre Syndrome 6 weeks after previous influenza vaccination.</p> <p><u>Contraindication</u> Severe allergic reaction to previous dose or any vaccine component (e.g., egg)</p>	No evidence of maternal or fetal risk when vaccine was given to pregnant women with underlying conditions that render them at high risk for serious influenza complications.
<b>MMR vaccine</b>	<ol style="list-style-type: none"> <li>1. Give SC</li> <li>2. For HCWs born in 1957 or later without serological evidence of immunity or prior vaccination</li> <li>3. Give 2 doses of MMR, 4 weeks apart.</li> </ol>	HCWs should have a documentation of 2 doses of MMR.	<p><u>Contraindication</u> Pregnancy, immunocompromised state* (including HIV-infected persons with severe immunosuppression).</p> <p><u>History of</u> thrombocytopenic purpura.</p> <p>Recent immunoglobulin administration.                      Moderate or severe current illness with or without fever</p> <p><u>History of</u> allergy or anaphylactic reaction to gelatin or neomycin.</p> <p><b>Pregnancy: Females should avoid getting pregnant for a minimum of 1 month after each shot.</b></p>	<ol style="list-style-type: none"> <li>1. MMR is the vaccine of choice if recipients are also likely to be susceptible to rubella and/or mumps</li> <li>2. Persons vaccinated between 1963 and 1967 with a killed measles vaccine alone, killed vaccine followed by live vaccine, or a vaccine of unknown type should be revaccinated with 2 doses of the live measles vaccine.</li> </ol>

Table 1-VI-03  
 Routine immunizations recommended for healthcare personnel...cont.

Generic name	Primary booster dose schedule	Indications	Major precautions and contraindications	Special considerations
<b>Meningococcal vaccine</b> (Meningococcal polysaccharide A, C, W135, and Y)	One dose in a volume specified by the manufacturer.	HCWs performing or participating in Hajj	<u>Precautions</u> Moderate or severe acute illness, with or without fever.  <u>History</u> of Guillian-Barre syndrome (if not high risk for meningococcal disease)	Studies of vaccinations with MPSV4 during pregnancy have not documented adverse effects either in pregnant women or newborns. On the basis of these data, pregnancy should not preclude vaccination with MPSV4 if indicated (refer to MMWR 48 (NORR-1), 17, 1999 CDC, ACP.
<b>Tetanus, diphtheria (Td)</b>	Td booster every 10 years following the completion of primary 3-dose series given IM.	All adults, tetanus prophylaxis in wound management.  All HCWs	Allergy or anaphylactic reaction to gelatin and neomycin or to any of the vaccine components following a prior dose	
<b>Tetanus-Diphtheria Acellular Pertussis (Tdap)</b>	One-time dose of Tdap to all HCWs younger than 65 years of age.	All HCWs in direct patient care, with priority given to those having contact with infants younger than 12 months of age.	<u>History of</u> hypersensitivity to the vaccine or its components. <u>History of</u> Encephalopathy or Guillain-Barre Syndrome (GBS) less than 6 weeks after previous dose of tetanus containing toxoid. <u>Precautions</u> Moderate or severe acute illness, with or without fever.  The safety of the vaccine in pregnant women has not been determined.	
<b>Hepatitis A vaccine</b>	Two doses of the vaccine 6 to 12 months apart (HAVRIX®, AVAXIM®)	For adults who have no sign of immunity or no previously documented series of 2 shots.	<u>History of</u> anaphylactic hypersensitivity to alum (or for HAVRIX®, the preservative 2-phenoxyethanol).  The safety of the vaccine in pregnant women has not been determined.	
<b>Rabies vaccine</b>	Refer to policies ICM-IV-07 to ICM-IV-08			

Table 2-VI-03  
**Other immunizations recommended for healthcare personnel  
in special circumstances** *(modified from ACIP recommendations)*

Generic name	Primary booster dose schedule	Indications	Major precautions and contraindications	Special considerations
<b>Varicella-Zoster live virus vaccine</b>	Two 0.5-ml doses SC, 4 weeks apart	For persons who have NO serologic evidence of immunity or 2 documented shots prior vaccination.	<p><u>Contraindication</u></p> <p>Severe allergic reaction after a previous dose or to any vaccine component. Anaphylactic reaction to gelatin and neomycin or any of the vaccine components.</p> <p>Immunosuppression due to leukemia, lymphoma, generalized malignancy, immune deficiency or immunosuppressive therapy.</p> <p>Moderate to severe immunodeficiency resulting from HIV infection.</p> <p><b>Pregnancy:</b></p> <p><u>Precautions</u></p> <p>Recent (≤11 months) receipt of antibody containing blood product (i.e. immunoglobulin, whole blood or packed red blood cells)</p> <p>Immunoglobulin should not be given for 3 weeks following vaccination. (specific interval depends on the product)</p> <p>Moderate or severe acute illness, with or without fever.</p>	

HDCV: Human diploid cell rabies vaccine

RVA: Rabies vaccine absorbed

IM: Intramuscularly

SC: Subcutaneously

Hep B: Written documentation of vaccination along with the level of anti-HBs 1-2 months postvaccination is mandatory for HCWs.

Persons immunocompromised because of immune deficiencies: HIV infection, leukemia, lymphoma, generalized malignancy, or immunosuppressive therapy with corticosteroids, alkylating drugs, anti-metabolites, or radiation.

TITLE/DESCRIPTION: <b>WORK RESTRICTIONS FOR HEALTHCARE WORKERS EXPOSED TO OR INFECTED WITH INFECTIOUS DISEASES</b>		INDEX NUMBER: <b>ICM –VI-04</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

This policy provides methods for decreasing the transmission of infections from healthcare personnel to patients.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 26: Occupational health. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Center for Disease Control and Prevention (CDC). (Last review 5/2/2001) Immunization of healthcare workers: recommendation of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Control Practices Advisory Committee (HICPAC). *MMWR*, 1997;46 (RR-18): 1-42.

## COMMENTS

The system for categorizing recommendations is as follows:

1. Category IA  
Strongly recommended for all hospitals and strongly supported by well-designed experimental or epidemiologic studies.
2. Category IB  
Strongly recommended for all hospitals and reviewed as effective in the field, representing a consensus of hospital Infection Control Practices Advisory Committee members on the basis of strong rationale and suggestive evidence, although definitive scientific studies have not been performed.
3. Category II  
Suggested for implementation in many hospitals. Recommendations may be supported by suggestive clinical or epidemiologic studies, a strong theoretic rationale, or definitive studies applicable to some but not all hospitals.
4. No recommendation or unresolved issue  
Practices with insufficient evidence or consensus regarding efficacy exists.

## PROCEDURE

Refer to [Table 1–VI-04](#), *Summary of suggested work restrictions for healthcare personnel exposed to or infected with infectious diseases of importance in healthcare settings* (modified from ACIP recommendations).

Table 1-VI-04  
**Summary of suggested work restrictions for health care personnel exposed to or infected with an infectious disease of importance in healthcare settings**  
*(modified from ACIP recommendations)*

Disease/problem	Work restriction	Duration	Category
<b>Conjunctivitis</b>	Restrict from patient contact and contact with the patients' environment	Until discharge ceases	II
<b>Cytomegalovirus infection</b>	No restriction		II
<b>Diarrheal diseases</b>			
<b>Acute stage</b> (diarrhea with other symptoms)	Restrict from patient contact, contact with the patients' environment, or food handling	Until symptoms resolve	IB
<b>Convalescent stage</b> (Salmonella spp.)	Restrict from care of high-risk patients, such as immunocompromised patients	Until symptoms resolve; consult with employee health	IB
<b>Diphtheria</b>	Exclude from duty	Until antimicrobial therapy is completed and 2 cultures obtained $\geq 24$ hours apart are negative	IB
<b>Enteroviral infections</b>	Restrict from care of infants, neonates, and immunocompromised patients and their environments	Until symptoms resolve	II
<b>Hepatitis A</b>	Restrict from patient contact, contact with the patients' environment, and food handling	Until 7 days after the onset of jaundice	IB
<b>Hepatitis B</b>	Refer to specific MOH recommendation in policy <a href="#">ICM–VII-04 Management of Occupational Exposure to HBV, HCV, and HIV</a>		
<b>Hepatitis C</b>	Refer to specific MOH recommendation in IPP <a href="#">ICM–VII-04 Management of Occupational Exposure to HBV, HCV, and HIV</a>		Unresolved issue
<b>Herpes simplex</b>			
<b>Genital</b>	No restriction		I
<b>Hands</b> (herpetic whitlow)	Restrict from patient contact and contact with the patients' environment	Until lesions heal	IA
<b>Orofacial</b>	Evaluate for need to restrict from care of high-risk patients	Consult with Employee Health	II

Table 1-VI-04  
**Summary of suggested work restrictions for health care personnel exposed to or infected with an infectious disease of importance in healthcare settings**  
 (modified from ACIP recommendations)

Disease/problem	Work restriction	Duration	Category
<b>Measles</b>	<b>Active</b>	Exclude from duty	IA
	<b>Post-exposure</b> (susceptible personnel)	Exclude from duty	IB
<b>Meningococcal meningitis</b>	Exclude from duty	Until 24 hours after the start of antibiotic therapy	IA
<b>Mumps</b>	<b>Active</b>	Exclude from duty	IB
	<b>Post-exposure</b> (susceptible personnel)	Exclude from duty	II
<b>Pediculosis</b>	Restrict from patient contact	Until treated and observed to be free of adult and immature lice	IB
<b>Pertussis</b>	<b>Active</b>	Exclude from duty	IB
	<b>Post-exposure</b> (asymptomatic personnel)	No restriction, prophylaxis recommended; refer to policy <a href="#">ICM – VI-09</a> , Management of Airborne and Droplet Infectious Disease Exposure in Healthcare Workers (Chickenpox, Measles, Rubella, Mumps, MTB, <i>N. meningitis</i> , Pertussis)	II
	<b>Post-exposure</b> (symptomatic personnel)	Exclude from duty	IB
<b>Rubella</b>	<b>Active</b>	Exclude from duty	IA
	<b>Post-exposure</b> (susceptible personnel)	Exclude from duty	IB
<b>Scabies</b>	Restrict from patient contact	Until cleared by medical evaluation	IB

Table 1-VI-04  
**Summary of suggested work restrictions for health care personnel exposed to or infected with an infectious disease of importance in healthcare settings**  
*(modified from ACIP recommendations)*

Disease/problem	Work restriction	Duration	Category
<b>Staphylococcus aureus infection</b>  <b>Active</b> , draining skin lesions  <b>Carrier state</b>	Restrict from contact with patients, the patients' environment, and food handling	Until lesions have resolved	IB
	No restriction, unless personnel are epidemiologically linked to transmission of the organism		IB
<b>Streptococcal group A infection</b>	Restrict from patient care, contact with patients' environment, or food handling	Until 24 hours after adequate antimicrobial therapy	IB
<b>Tuberculosis</b>  <b>Active disease</b>  <b>Latent TB infection</b>	Exclude from duty	Until proven noninfectious by physician	IA
	No restriction	Treatment for latent TB infection	IA
<b>Varicella</b>  <b>Active</b>  <b>Post-exposure</b> (susceptible personnel)	Exclude from duty	Until all lesions are dry and crusted over	IA
	Exclude from duty	From the 10 <sup>th</sup> day after the 1 <sup>st</sup> exposure through the 21 <sup>st</sup> day (28 <sup>th</sup> day if VZIG given) after the last exposure	IA
<b>Zoster</b>  <b>Localized</b> , in a healthy person  <b>Generalized or localized</b> in an immunosuppressed person  <b>Post-exposure</b> (susceptible personnel)	Cover lesions; restrict from care of high-risk patients <sup>+</sup>	Until all lesions are dry and crusted over	II
	Restrict from patient contact	Until all lesions are dry and crusted over	IB
	Restrict from patient contact	From the 10 <sup>th</sup> day after the 1 <sup>st</sup> exposure through the 21 <sup>st</sup> day (28 <sup>th</sup> day if VZIG given) after the last exposure or, if varicella occurs, until all lesions are dry and crusted over	IA
<b>Viral respiratory infections, acute febrile</b>	Consider excluding from the care of high-risk patients <sup>++</sup> or from contact with their environment during community outbreaks of RSV and influenza	Until acute symptoms resolve	IB

\* Unless epidemiologically linked to the transmission of infection

+ Those susceptible to varicella and those who are at increased risk of complications due to varicella, such as neonates and immunocompromised persons of any age

++ High-risk patients as defined by the ACIP for complications due to influenza

TITLE/DESCRIPTION: <b>PREGNANT HEALTHCARE WORKERS</b>		INDEX NUMBER: <b>ICM –VI-05</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide infection control guidelines for pregnant healthcare workers (HCWs).

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 109: The pregnant healthcare worker. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. CDC Personnel Health Guidelines. Infection control issues for healthcare personnel: an overview. *AJIC*. 1998 26(3): 291-327.

## COMMENTS

1. The occupational acquisition of infection is of special concern to pregnant HCWs because some infections, such as CMV, rubella, and parvovirus, can have severe effects on the fetus.
2. HCWs planning on becoming pregnant should be reassured with emphasis on practicing standard precautions when dealing with patients.
3. Female HCWs of childbearing age should be advised regarding the performance of pre-pregnancy screening tests during their pre-employment physical evaluation and should be offered the appropriate vaccines.

## PROCEDURE

Refer to [Table 1 – VI-05](#) *The pregnant worker: pertinent facts to guide management of occupational exposures to infectious agents.*

Table 1-VI-05  
**The pregnant healthcare worker: pertinent facts to guide the management of occupational exposures to infectious agents**

Agent	In-hospital source	Potential effect on fetus	Rate of perinatal transmission	Maternal screening	Prevention
<b>Cytomegalovirus (CMV)</b>	Urine, blood, semen, vaginal secretions, immunocompromised or transplant patients, dialysis, day care	Classic cytomegalic inclusion disease* 5% to 10%  Hearing loss 10% to 15%	Primary infection 25% to 50%  Recurrent infection 52%  Symptomatic <5% to 15%	Routine screening not recommended  Antibody is not completely protective	Efficacy of CMV immuno-globulin not established  No vaccine available  Standard Precautions
<b>Hepatitis B (HBV)</b>	Blood, body fluids, vaginal secretions, semen	Hepatitis; early onset hepatocellular carcinoma	HB <sub>e</sub> Ag positive 90% HBsAg positive 10%	Routine HB <sub>s</sub> Ag testing is advised.	HBV vaccine during pregnancy Neonate:  Vaccine/HBIG at birth  Standard Precautions
<b>Hepatitis C (HCV)</b>	Blood, sexual contact	Hepatitis	5% (0 to 25%)	Anti-HCV or HCV RNA routine screening not recommended	No vaccine or immunoglobulin is available  Post-exposure treatment with antiviral agents  Standard Precautions
<b>Herpes simplex virus (HSV)</b>	Vesicular fluid, oropharyngeal and vaginal secretions	Sepsis, encephalitis, meningitis; mucocutaneous lesions; congenital malformations (rare)	Primary genital 33% to 50%  Recurrent genital 1% to 2%	Antibody testing minimally useful  Inspection for genital lesions during labor	Chemoprophylaxis at 36 weeks decreases shedding  Standard Precautions
<b>Human immunodeficiency virus (HIV)</b>	Blood, body fluids, vaginal secretions, semen	Acquired immunodeficiency disease syndrome (AIDS) by 2-4 years of age  No congenital syndrome	Depends on HIV viral titer  If viral titer is <1000, then the rate is 2%  If viral titer ≥10,000 then the rate can be up to 25%	Routine maternal screening advised (HIV ELISA, Western blot)  If exposed, then testing at 3, 6 and 12 months is recommended	Antiretroviral chemoprophylaxis available for exposure, postnatal chemoprophylaxis for HIV-positive mothers and their infants  Standard Precautions

Table 1-VI-05:...cont.  
**The pregnant healthcare worker: pertinent facts to guide the management of occupational exposures to infectious agents**

Agent	In-hospital source	Potential effect on fetus	Rate of perinatal transmission	Maternal screening	Prevention
<b>Influenza</b>	Sneezing and coughing, respiratory tract secretions	No congenital syndrome; influenza in the mother can cause hypoxia in fetus	Rare	None	TIV for all pregnant women during influenza season to decrease the risk of hospitalization for cardiopulmonary complications  Droplet Precautions
<b>Measles (Rubella)</b>	Respiratory secretions, coughing	Prematurity, spontaneous abortion, congenital syndrome	Rare	Antibody test	Vaccine  Airborne Precautions
<b>Parvovirus B19</b>	Respiratory secretions, blood, immunocompromised patients	Fetal hydrops, stillbirth; no congenital syndrome	Approximately 25% Fetal death <10%	No routine screening; B19 DNA can be detected in serum, leukocytes, respiratory secretions, urine, and tissue specimens	No vaccine, defer care of immunocompromised patients with chronic anemia  Droplet Precautions
<b>Rubella</b>	Respiratory secretions	Congenital syndrome *	90% in the first trimester, 40% to 50% overall	Routine rubella IgG testing in pregnancy  Preconceptual screening recommended	Vaccine* No congenital rubella syndrome described for vaccine  Droplet Precautions  Contact Precautions for congenital rubella
<b>Syphilis</b>	Blood; lesions; fluid; amniotic fluid	Congenital syndrome *	10% to 90%, depending on the stage of maternal disease and the trimester at the time of infection	VDRL, RPR** FTA ABS	Post-exposure prophylaxis with penicillin  Standard Precautions Gloves until 24 hrs of effective therapy has been completed for infants with congenital syphilis  Contact Precautions when skin and mucous membrane lesions are present

Table 1-VI-05:...cont.  
**The pregnant healthcare worker: pertinent facts to guide the management of occupational exposures to infectious agents**

Agent	In-hospital source	Potential effect on fetus	Rate of perinatal transmission	Maternal screening	Prevention
<b>Toxoplasmosis</b>	No human-to-human spread; raw meat, cat feces, unwashed fruits and vegetables	Congenital syndrome*	30% to 50%; rate increases as pregnancy advances, severe disease after primary infection in first trimester	Antibody protects against disease. Routine screening not recommended in the US	Frozen or cooked meat; avoid or glove for contact with cat feces; wash fruits, vegetables, change cat litter at least once every 24 hours
<b>Tuberculosis</b>	Sputum; skin lesions	Neonatal tuberculosis, liver most frequently affected.	Rare	Tuberculin Skin test (TST** or PPD***)  Quantiferon (TBQ) Chest radiograph	INH and ethambutol + rifampin for active maternal disease  Airborne Precautions
<b>Varicella-zoster virus</b>	Respiratory secretions, vesicular fluid	Malformations (skin, limb, CNS, eye); chickenpox, zoster	Total 25%  Congenital syndrome 2% (0 to 4%)	History, antibody	Vaccine <sup>+</sup> or VZIG within 96 hours of exposure if susceptible  Airborne Precautions Contact Precautions
<b>Hepatitis A (HAV)</b>	Feces most commonly, blood (rarely)	No fetal transmission, transmission may occur at the time of delivery if the mother is still in the infectious phase	None	Routine screening not recommended.	Vaccine is a killed virus vaccine and can safely be used in pregnancy  Contact Precautions during the acute phase

\* Congenital syndrome: varying combinations of jaundice, hepatosplenomegaly, microcephaly, CNS abnormalities, thrombocytopenia, anemia, retinopathy, and skin and bone lesions

+ Live virus vaccines should be given **before or after** pregnancy

++ VDRL, Venereal Disease Research Laboratory test; RPR, rapid plasma reagin test

\*\* PPD, purified protein derivative

\*\*\* TST, Tuberculin Skin Test

TITLE/DESCRIPTION: <b>HEPATITIS A IMMUNIZATION FOR HEALTHCARE WORKERS</b>		INDEX NUMBER: <b>ICM – VI-06</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines for Hepatitis A virus (HAV) immunization of healthcare workers (HCWs).

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 81: Viral hepatitis. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Manual of Immunization for G.C.C. States (1996)
3. Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP), (19 May 2006) 55:(RR07);1-23
4. Red Book. (2009). Report of the Committee on Infectious Diseases. *The American Academy of Pediatrics*.

## COMMENTS

1. Saudi Arabia is an area of intermediate endemicity for HAV.
2. In endemic areas, the HAV vaccine is recommended for:
  - a. Persons residing in institutions
  - b. Food handlers
  - c. Municipal workers
  - d. Healthcare workers
  - e. Day-care staff and children
  - f. Homosexually active males
  - g. Injecting drug users
  - h. Persons with chronic liver disease
3. The HAV vaccine is contraindicated in those with known hypersensitivity to any of the vaccine components, such as alum and phenoxyethanol.
4. The effect of the HAV vaccine on pregnancy and lactation has not been assessed.

## PROCEDURE

### A. Pre-vaccination testing and counseling

1. Screen for HAV antibodies in employees to ensure adequate protection against HAV for prior immunity.
2. Offer inactivated HAV vaccination to those who are non-immune.
3. Exclude from immunization those for whom the vaccine is contraindicated.
4. Educate employees on modes of transmission, which are mainly fecal-oral and waterborne routes, homosexual activity (for males), and intravenous drug use.
5. Explain the risks of foregoing immunization to all employees who refuse HAV immunization.

**B. Vaccine administration**

1. Give 2 doses of the inactivated HAV vaccine to all relevant persons 6 to 12 months apart for a full immunization regimen.
  - a. AVAXIM®
    - i. Two doses 6-12 months apart, with 1440 ELISA units per dose, IM in the deltoid muscle.
    - ii. Second (booster) dose, 6 to 12 months after the primary dose, of 1440 ELISA units IM in the deltoid.
  - b. HAVRIX®
    - i. Pediatric dose
      - Two doses should be given, 6 to 12 months apart, with 720 ELISA units per dose, IM in the deltoid muscle (for patients aged 12 months to 18 years).
    - ii. Adult dose
      - Two doses should be given 6 to 12 months apart with 1440 ELISA units per dose, IM in the deltoid muscle (for patients aged  $\geq$  19 years).

**C. Post-immunization serologic testing**

Not indicated

**D. Concurrent use of HAV vaccine and immunoglobulin**

Refer to policy [ICM-IV-04](#) *Hepatitis A Virus Exposure Management*.

TITLE/DESCRIPTION: <b>HEPATITIS B IMMUNIZATION FOR HEALTHCARE WORKERS</b>		INDEX NUMBER: <b>ICM – VI-07</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines on Hepatitis B immunization.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 81: Viral hepatitis. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Red Book. (2009). Report of the Committee on Infectious Diseases. *The American Academy of Pediatrics*.

## COMMENTS

1. All HCWs at risk of exposure to blood or body fluids should ensure that they present immunity against Hepatitis B virus.
2. All new HCWs will be tested for Hepatitis B immunity.

## PROCEDURE

### A. Pre-vaccination testing

1. Screen all new HCWs for HBsAg and anti-HBs to verify HBV immune status.
2. Provide Hepatitis B immunization to those HCWs who are non-immune for Hepatitis B, i.e., those with anti-HBs < 10 mIU/L, unless they provide documentation of a completed vaccination series and anti-HBs levels > 10 mIU/L 1 to 2 months post-vaccination.
3. Explain the risks of non-immunization to all HCWs who refuse immunization and have them sign a disclaimer form if they refuse immunization.

### B. Administration of the vaccine

1. Give three doses of Hepatitis B vaccine with the second and third doses at 1 and 6 month intervals, as recommended by the manufacturer (as per package insert).
2. Use a 22 to 25 gauge needle, at least 1 to 1.5 inches long. Administer 1.0 ml intramuscularly (IM) into the deltoid muscle. Do not administer in the gluteal region; if this has been done, the dose should be repeated.

### C. Post-vaccination serological testing

1. To ensure adequate seroconversion and protection:
  - One to two months after completing the series, the vaccine level of anti-HBs is expected to be > 10 mIU/L, and this value should be checked in any HCW with patient exposure.

**D. Non-responders to the first series of vaccination**

If anti-HBs levels are <10 mIU/L 1 to 2 months post-vaccination, take the following steps:

1. A full 2<sup>nd</sup> series of 3 doses should be given.
2. One month after completing the 2<sup>nd</sup> series, the vaccine level of anti-HBs is expected to be > 10 mIU/L, and this value should be checked in any HCW with patient exposure.
3. If the HCW remains anti-HBs-negative, then he/she is considered a non-responder and should be counseled accordingly.

**E. Counseling non-responders**

1. If all of the above measures were taken and the HCW remains anti-HBs-negative, no further doses should be given.
2. The importance of standard precautions and policy should be stressed to the HCW.
3. The HCW should receive an HBsAg test; if positive, he/she should receive counseling as mentioned above. Professional duties should be reviewed along with appropriate referrals.
4. HBsAg-negative HCWs who fail to seroconvert should receive HBIG if exposed to HBsAg-positive blood products or body fluid. Refer to policy [ICM-VII-04](#) *Management of Occupational Exposure to HBV, HCV, and HIV*.

TITLE/DESCRIPTION: <b>VARICELLA IMMUNIZATION FOR HEALTHCARE WORKERS</b>		INDEX NUMBER: <b>ICM – VI-08</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To describe the criteria and conditions for administering the Varicella vaccine to healthcare workers (HCWs) and the evaluation of HCWs following Varicella Zoster (VZV) infection.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 26: Occupational health. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Centers for Disease Control and Prevention (CDC). Prevention of varicella: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* June 22, 2007/56 (RR04).1-40. Updated: January 31, 2008.
3. Red Book (2009)

## COMMENTS

1. The varicella zoster immune status of all HCWs with direct patient contact should be known. Those who are non-immune will be provided the varicella zoster vaccine unless there is a contraindication.
2. A history of documented varicella infection is considered adequate evidence of being immune.

## PROCEDURE

### A. Pre-vaccination counseling

1. Advise all HCWs about the seriousness of Varicella infection transmitted to patients, especially the following:
  - a. Elderly patients
  - b. Neonates
  - c. Immunocompromised patients
  - d. Transplant patients
2. Test those who are unaware of their serological status for varicella antibodies. A HCW who is found to be immune will require no further action, and the results of varicella serology should be documented in the employee's medical records.
3. Provide the vaccine to those who are found to be non-immune.
4. Documentation of two previous vaccine shots will preclude any further immunization.

### B. Vaccine administration

1. The varicella vaccine is not 100% protective.
2. Defer vaccination for at least 5 months following blood or plasma transfusions or the administration of immunoglobulin (including VZIG) because passively acquired antibodies may inactivate the vaccine.

3. Administer the varicella vaccine (Oka/Merck) as a 0.5ml subcutaneous dose in the outer aspect of the upper arm (deltoid). Give the second dose 4 weeks later.
4. Do not administer immunoglobulin (including VZIG) concurrently with the vaccine or for 2 weeks after vaccination.
5. Avoid the use of salicylates for 6 weeks following vaccination. Avoid immunoglobulin administration for 2 months unless it outweighs the benefits of immunization.
6. Avoid getting pregnant for 1 month after each shot.

### C. Complications of the vaccine

1. Some HCWs may develop papular or vesicular skin lesions at the injection site following vaccination. These lesions should be covered with a bandage, and the person should be allowed to work. However, the employee should not be allowed to work with immunocompromised patients. There should be a daily evaluation in the Employee Health Clinic for dissemination of lesions for up to 21 days after the vaccination.
2. Some HCWs may develop disseminated papular or vesicular skin lesions following vaccination. These persons should be removed from work until all lesions have dried and crusted over.

### D. Management of varicella exposure in HCWs

1. Confirm the source has varicella zoster infection by history and physical examination. Diagnosis can be aided by direct fluorescent antigen (DFA) stain, PCR or viral culture.
2. Varicella exposure for a susceptible employee is defined as being within a confined airspace (i.e., being in the same room or face-to-face contact) with an infectious patient.
3. Persons with varicella can be infectious up to 2 days before rash onset.
4. Obtain a history of varicella or zoster infection in the employee. Review serology for VZV antibodies.
5. The employee is considered immune if he/she has a documented history of VZV infection or positive VZV serology; he/she may return to work following exposure.
6. An employee with a negative or uncertain history of VZV infection who has not been vaccinated or who has received only a single dose of the vaccine should undergo serological testing for varicella. If the serology results are positive, he/she may return to work. If the serology results are negative, the employee should be furloughed from work from days 10 to 21 post-exposure. The varicella vaccine (1<sup>st</sup> dose) should be given within 3 to 5 days if there are no contraindications to the vaccine. Give the 2<sup>nd</sup> dose of the vaccine 4 weeks later.
7. Exposed seronegative healthcare workers (HCWs) who did not receive the vaccine because of medical contraindication and immunocompromised or pregnant HCWs should receive varicella zoster immunoglobulin (VZIG; 125 units/10 kg body weight up to a maximum of 625 units) intramuscularly within 96 hours of exposure. If VZIG cannot be administered within this time frame, then intravenous immunoglobulin (IVIG) can be considered (one dose of 400 mg/kg). Healthcare workers who receive VZIG should be furloughed from day 10 through day 28 post-exposure.
8. An employee with a negative or uncertain history of VZV infection and a history of vaccination with both doses should have serology results obtained. If the serology results are positive, the employee may work. If the serology results are negative or indeterminate, the employee should be furloughed from day 10 through day 21.
9. If the HCW develops Varicella, he/she should be removed from work and treated with antiviral therapy (Acyclovir, 800 mg) PO 5 times per day for 5 to 7 days. Treatment must be started within 72 hours of the onset of clinical infection. The HCW may return to work when all skin lesions are crusted over.

<b>TITLE/DESCRIPTION:</b> <b>MANAGEMENT OF SELECTED AIRBORNE AND DROPLET  INFECTION DISEASE EXPOSURES IN  HEALTHCARE WORKERS</b>		<b>INDEX NUMBER:</b> <b>ICM – VI-09</b>
<b>EFFECTIVE DATE:</b> 01/01/2009 01/01/2013	<b>APPLIES TO:</b> All GCC Countries	<b>ISSUING AUTHORITY:</b> <b>GULF COOPERATION COUNCIL –  CENTRE FOR INFECTION CONTROL  (GCC-CIC)</b>

## DEFINITION

To provide guidelines for the management of healthcare workers (HCWs) exposed to selected infectious disease transmissible via the airborne or droplet routes.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 26: Occupational health. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007
3. Herwaldt LA, et al. Exposure workups. *Infection Control Hosp Epidemiol* 1997;18:850-71.
4. Red Book. (2006). Committee on Infectious Disease. *The American Academy of Pediatrics*.

## COMMENTS

1. The infection control surveillance clinic will assess HCWs for exposure, prophylaxis, treatment, and work exclusion and will notify Infection Control of the actions taken. When the Employee Health Clinic is closed, HCWs should seek medical attention in the Emergency Room. Expert consultation may be obtained from Infection Control Practitioners or the Infectious Disease Consultant on call during weekends and holidays.
2. Management of the following conditions is outlined:
  - a. Varicella (Chickenpox) and shingles
  - b. Measles
  - c. Rubella
  - d. Mumps
  - e. *Mycobacterium tuberculosis*
  - f. Meningococcal meningitis (*Neisseria meningitidis*)
  - g. Pertussis

**A. MANAGING VARICELLA (CHICKENPOX) or SHINGLES EXPOSURE**

1. **PROCEDURE:** Refer to [Appendix 1 –VI-09](#), page 143.
2. **EXPLANATION:**
  - a. Incubation period  
Usually 14-16 days; range, 10-21 days; up to 28 days in persons who have received varicella zoster immunoglobulin (VZIG).
  - b. Exposure criteria
    - *Varicella*  
A household contacts, face-to-face contact for more than 5 minutes with an infected person without wearing a surgical mask, or direct contact with vesicle fluid without wearing gloves.
    - *Shingles*  
Direct contact with vesicle fluid without wearing gloves.
  - c. Period of communicability
    - *Varicella*  
Affected persons are most contagious 1-2 days before and shortly after vesicles appear. Transmission can occur up to 5 days after onset of rash. Immunocompromised persons may be contagious as long as new vesicles are appearing.
    - *Shingles*  
Affected persons are most contagious from 24 hours before the first vesicle appears and up to 48 hours after the final vesicle appears.
  - d. Employee health
    - Assess immunity: HCW is susceptible unless he or she has a history of varicella or has serological evidence of immunity. Consider checking varicella IgG antibody titer to determine the immune status of the HCW.
    - For vaccination of HCWs against VZV, refer to policy [ICM–VI-08](#) *Varicella Immunization for Healthcare Workers*.
  - e. Work restrictions
    - *Exposed*  
From days 1-7 of exposure no restrictions is required.  
HCW should be excluded from duty on days 10-21 after a single exposure or day 8 of the first exposure through day 21 of last exposure (28<sup>th</sup> day if VZIG was given after the last exposure).
    - *Infected*  
HCW may return to work after all lesions have crusted over.
  - f. Prophylaxis  
Consider giving VZIG to non-immune, immunocompromised persons or pregnant women within 96 hours of exposure.

**B. MANAGING MEASLES EXPOSURE**

1. **PROCEDURE:** Refer to [Appendix 2 –VI-09](#), page 144.
2. **EXPLANATION:**
  - a. Incubation period  
Usually 8-12 days; range, 7-18 days.
  - b. Exposure criteria  
Spending time in a room with an infected person without wearing a respirator. If air is recirculated, spending time in the area supplied by the air-handling system while an infected person was present or within 1 hour after the person's departure. Contact with nasal or oral secretions from an infected person or items contaminated with these secretions without wearing gloves.
  - c. Period of communicability  
From 3 to 5 days before the rash appears to 4 to 7 days after the rash appears, but transmission is minimal by 2 to 4 days after the rash appears.
  - d. Employee health  
Assess immunity; an HCW is susceptible unless he or she was born before 1957, provides serological evidence of immunity, or has two documented doses of measles vaccine. Obtain blood for IgG antibody titers as needed. For staff who has not received two doses of measles vaccine, consider initiating or completing the vaccine series.
  - e. Work restrictions
    - *Exposed*  
From days 1-4 no restrictions required. From days 5 to 21 for a single exposure or day 5 of the first exposure through day 21 of the last exposure the HCW either must not work or must have no direct patient contact or must only work with immune persons away from patient care areas.
    - *Infected*  
HCW may return to work 4 days after developing a rash.
  - f. Prophylaxis  
Consider giving susceptible HCWs the vaccine within 3 days or IG within 6 days of exposure to modify severity of infection; vaccine or IG given after exposure does not change work restrictions.

### C. MANAGING RUBELLA EXPOSURE

1. **PROCEDURE:** Refer to [Appendix 3–VI-09](#), page 145.
2. **EXPLANATION:**
  - a. Incubation period  
Usually 16-18 days; range, 14-21 days.
  - b. Exposure criteria  
Contact within 3 feet of an infected person without wearing a mask; contact with nasopharyngeal secretions from an infected person or items contaminated with these secretions without wearing gloves; contact with nasopharyngeal secretions or urine from an infant with congenital rubella without wearing gloves.
  - c. Period of communicability  
From 7 days before the rash to 7 days after the rash appears; up to 1 year for infants with congenital rubella.
  - d. Employee health  
Assess immunity; an HCW is susceptible unless he or she was born before 1957, provides serological evidence of immunity, or has one documented dose of rubella vaccine. Obtain blood for IgG antibody titers as needed. For staff who has not received two doses of rubella vaccine, consider initiating or completing the vaccine series.
  - e. Work Restrictions
    - *Exposed*  
From days 1-6 no restrictions required. From days 7-21 for a single exposure or day 7 of the first exposure through day 21 of the last exposure the HCW either must not work or must have no direct patient contact or must only work with immune persons away from patient care areas.
    - *Infected*  
HCW may return to work 5 days after developing rash.
  - f. Prophylaxis  
None; the rubella vaccine does not prevent infection after exposure. IG does not prevent infection.

**D. MANAGING MUMPS EXPOSURE**

1. **PROCEDURE:** Refer to [Appendix 4 – VI-09](#), page 146.
2. **EXPLANATION:**
  - a. Incubation period  
Usually 14-16 days; range, 12-25 days.
  - b. Exposure criteria  
Being within 3 feet of an infected person without wearing a mask; contact with saliva or items contaminated with saliva from an infected person without wearing gloves.
  - c. Period of communicability  
Patients are most communicable 48 hours before the onset of illness, but communicability may begin as early as 7 days before the onset of overt parotitis and continue for 5 to 9 days (average, 5 days) thereafter.
  - d. Employee health  
Assess immunity; an HCW is susceptible unless he or she was born before 1957, provides serologic evidence of immunity, or has one documented dose of mumps vaccine. Obtain blood for IgG antibody titers as needed. For staff who has not received two doses of mumps vaccine, consider initiating or completing the vaccine series.
  - e. Work restrictions
    - *Exposed*  
From days 1-8, no restrictions required. From days 9-26 for a single exposure, day 9 of the first exposure through day 26 of the last exposure, or until 9 days after the onset of parotitis the HCW either must not work or must have no direct patient contact, or work only with immune persons away from patient care areas.
    - *Infected*  
HCW may return to work 9 days after the onset of parotid gland swelling.
  - f. Prophylaxis  
None; the mumps vaccine is not proven to prevent infection after exposure; mumps IG does not prevent infection.

**E. MANAGING *MYCOBACTERIUM TUBERCULOSIS* EXPOSURE**

1. **PROCEDURE:** Refer to [Appendix 5 –VI-09](#), page 147.
2. **EXPLANATION:**
  - a. Incubation period  
From 2 to 10 weeks after exposure to detection of positive Purified Protein Derivative (PPD); the risk of developing active disease is greatest in the first 2 years after exposure.
  - b. Exposure criteria  
Spending time in a room with a person who has active disease without wearing an N95 respirator; packing or irrigating wounds infected with *M. tuberculosis* without wearing an N95 respirator.
  - c. Period of communicability  
Persons whose smears are AFB positive are 20 times more likely to cause secondary infections than persons who are smear negative. Children with primary pulmonary TB are rarely contagious.
  - d. Employee health  
Obtain baseline PPD results if they have not been collected recently and if the HCW was previously negative; perform post-exposure PPD test at 12 weeks; prescribe prophylaxis if post-exposure PPD test is positive.
  - e. Work restrictions
    - *Exposed*  
None, for persons whose PPD results are positive
    - *Infected*  
Restrict HCWs with active TB from duty until after they have taken 2 to 3 weeks of effective anti-tuberculosis chemotherapy and they have had 3 AFB-negative sputum samples on 3 separate days.
  - f. Prophylaxis  
Prescribe Isoniazid 300 mg daily for 6 months (or 12 months for HIV-infected persons) and pyridoxine 20-40 mg daily.  
  
Refer to policy [ICM-V-03](#) *Management of Suspected/Confirmed Cases of Infectious Tuberculosis*.

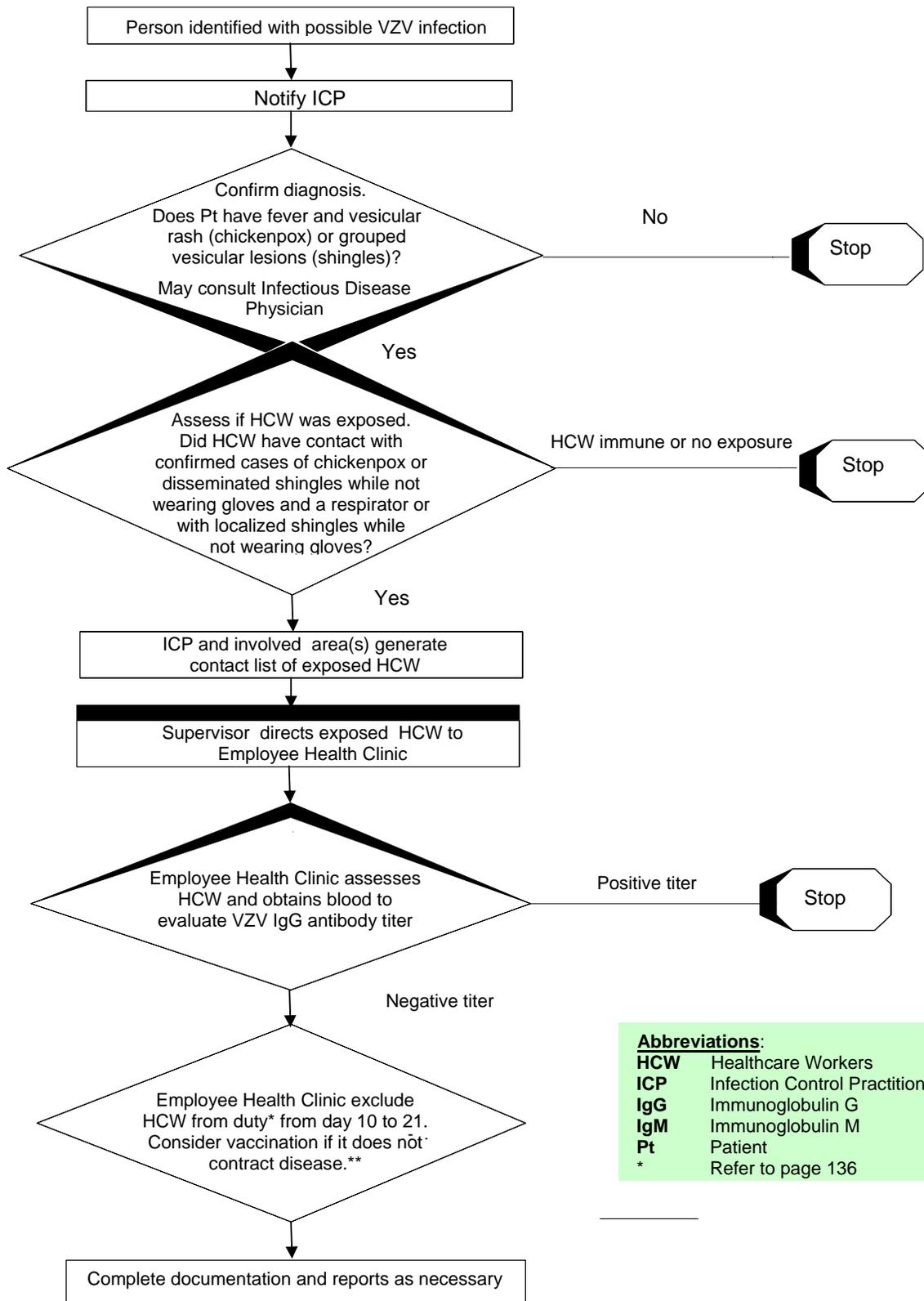
**F. MANAGING MENINGOCOCCAL DISEASE EXPOSURE**

1. **PROCEDURE:** Refer to [Appendix 6 – VI-09](#), page 148.
2. **EXPLANATION:**
  - a. Incubation period  
Usually  $\leq 4$  days; range, 1-10 days.
  - b. Exposure criteria  
Extensive contact with respiratory secretions from an infected person without wearing a mask, particularly when suctioning, resuscitating, or intubating.
  - c. Period of communicability  
Persons are infectious until they have taken 24 hours of effective antibiotic therapy.
  - d. Employee health  
Prescribe prophylaxis; educate exposed HCWs about the signs and symptoms of meningitis.
  - e. Work restrictions
    - *Exposed*  
None
    - *Infected*  
HCW should be restricted from work until they have taken 24 hours of effective antibiotic therapy.
  - f. Prophylaxis  
Rifampin 600 mg every 12 hours for 2 days (contraindicated in pregnancy) or Ciprofloxacin 500 mg single dose (contraindicated in pregnancy) or Ceftriaxone 250 mg IM single dose (safe during pregnancy).

## G. MANAGING PERTUSSIS EXPOSURE

1. **PROCEDURE:** Refer to [Appendix 7 –VI-09](#), page 149.
2. **EXPLANATION:**
  - a. Incubation period  
Usually 7-10 days; range, 6-20 days.
  - b. Exposure criteria
    - Face-to-face contact without wearing a mask for more than 10 min.
    - Spending 1 hour in a room with a confirmed case without wearing a mask.
  - c. Period of communicability  
Patients are most contagious during the catarrhal stage; communicability diminishes rapidly after the onset of coughing but can persist for as long as 3 weeks.
  - d. Employee health  
If the HCW has no symptoms, he/she should begin prophylaxis and return to work. If the HCW is symptomatic, he/she should begin therapy and exclude from work until test results are available.
  - e. Work restrictions
    - *Exposed:*
      - Post-exposure (asymptomatic): No restrictions, prophylaxis recommended.
      - Post-exposure (symptomatic): Exclude from duty until 5 days after initiating effective therapy or until the disease is excluded by negative serology and negative nasopharyngeal culture.
    - *Active:*  
Exclude from duty from the beginning of the catarrhal stage through the 3<sup>rd</sup> week after the onset of paroxysm or until 5 days after the start of effective antimicrobial therapy.
  - f. Prophylaxis  
The recommended drug is erythromycin (40 mg/kg/day in 4 divided doses, maximum of 2 gm/day) for 14 days (estolate preparation is preferred).  
Azithromycin or clarithromycin may be tolerated better than erythromycin. If the HCW is allergic to the macrolide group, Cotrimoxazole DS (1 tablet twice daily for 14 days) can be administered.

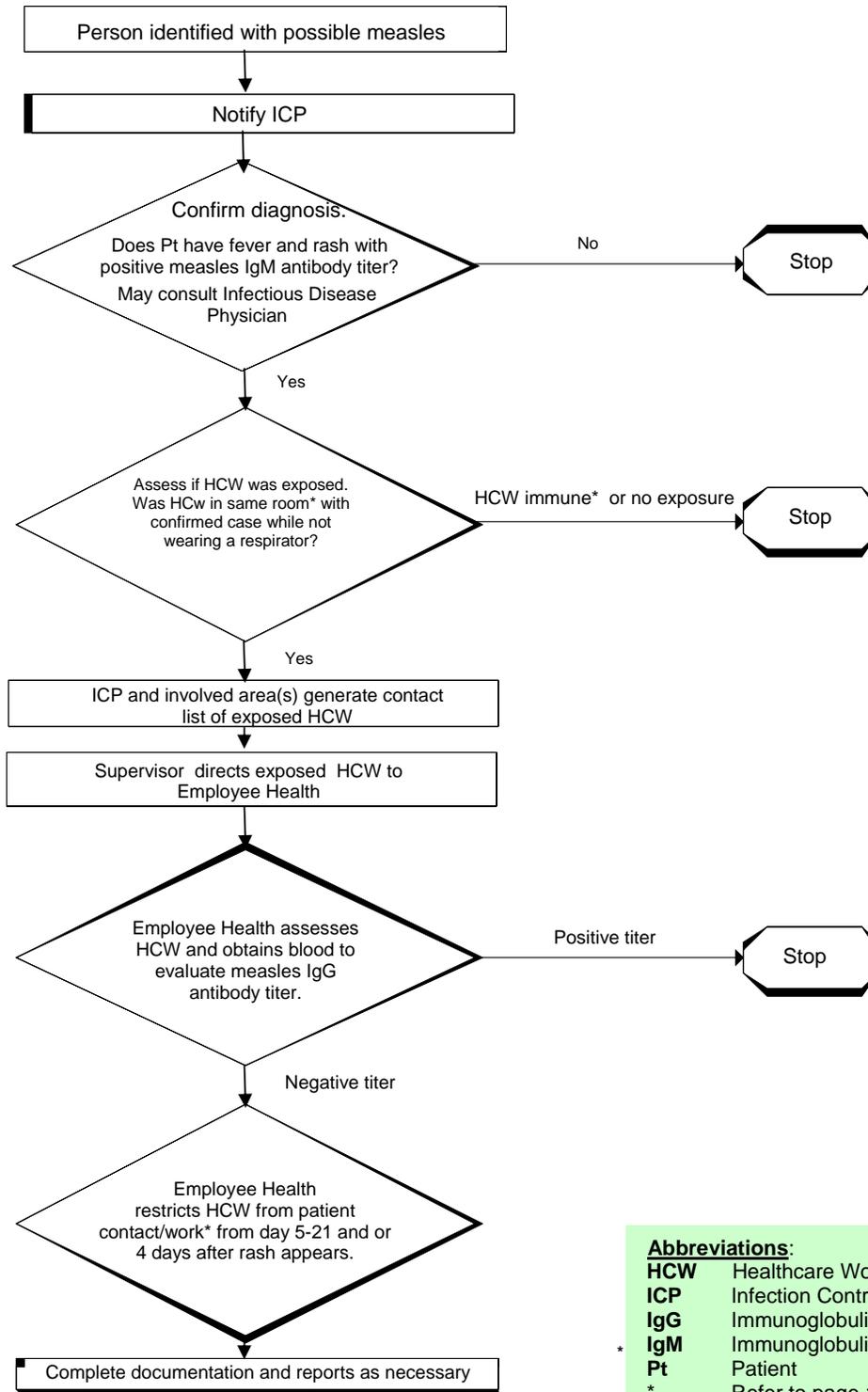
Appendix 1-VI-09: Varicella or Shingles Exposure



**Abbreviations:**

<b>HCW</b>	Healthcare Workers
<b>ICP</b>	Infection Control Practitioner
<b>IgG</b>	Immunoglobulin G
<b>IgM</b>	Immunoglobulin M
<b>Pt</b>	Patient
<b>*</b>	Refer to page 136

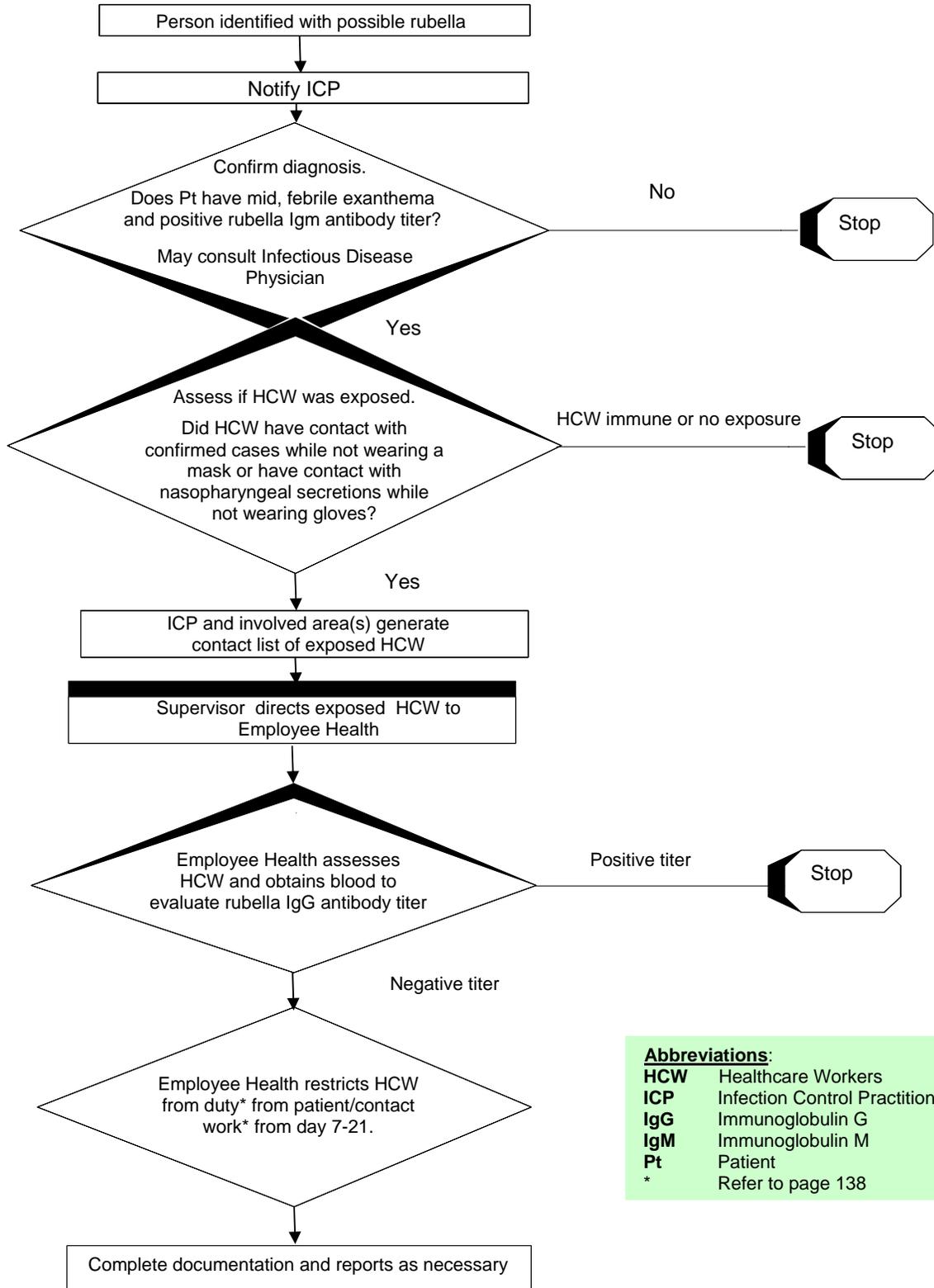
Appendix 2-VI-09: Measles Exposure



**Abbreviations:**

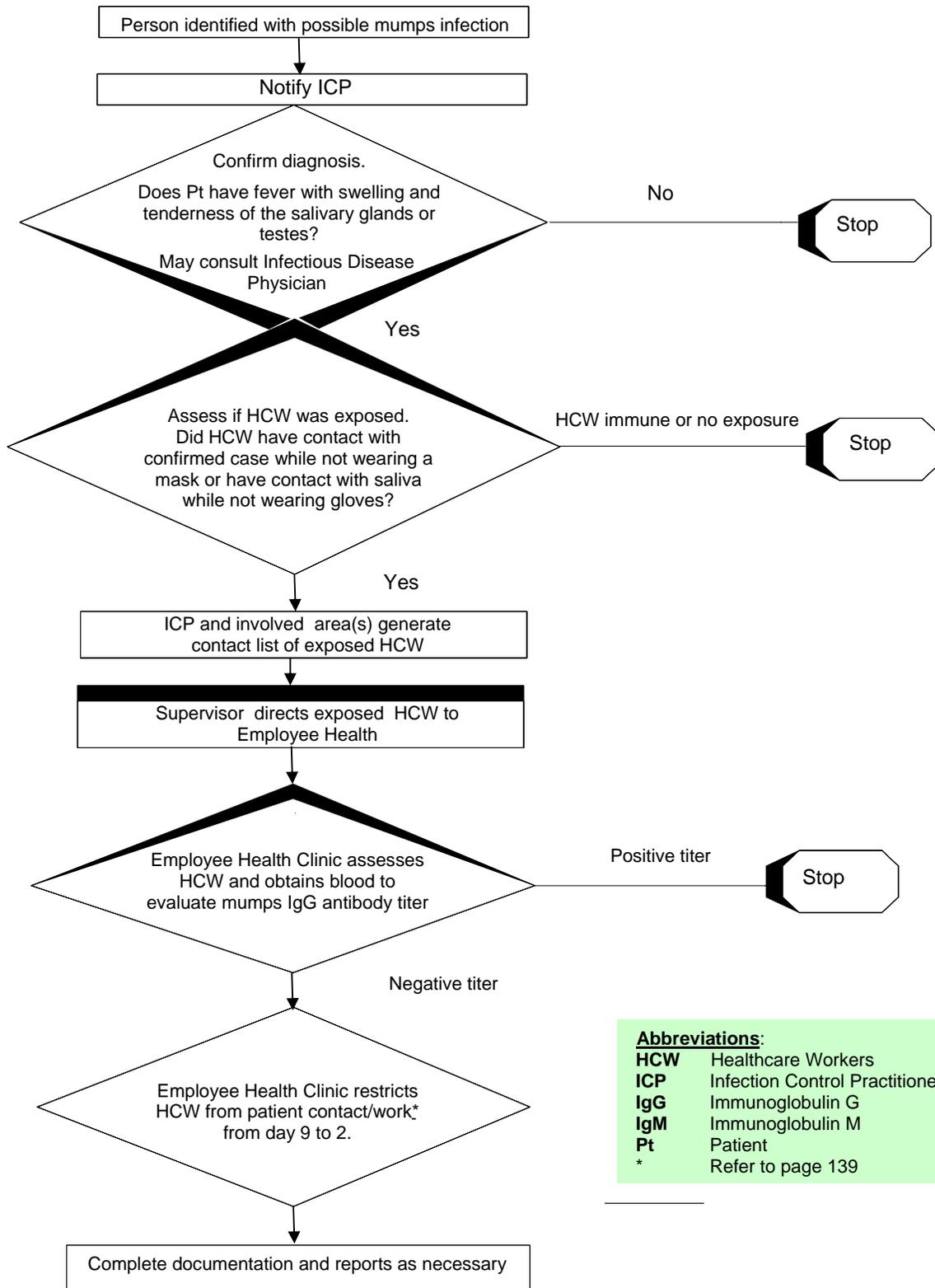
- HCW** Healthcare Workers
- ICP** Infection Control Practitioner
- IgG** Immunoglobulin G
- IgM** Immunoglobulin M
- Pt** Patient
- \*** Refer to page 137

Appendix 3-VI-09: Rubella Exposure



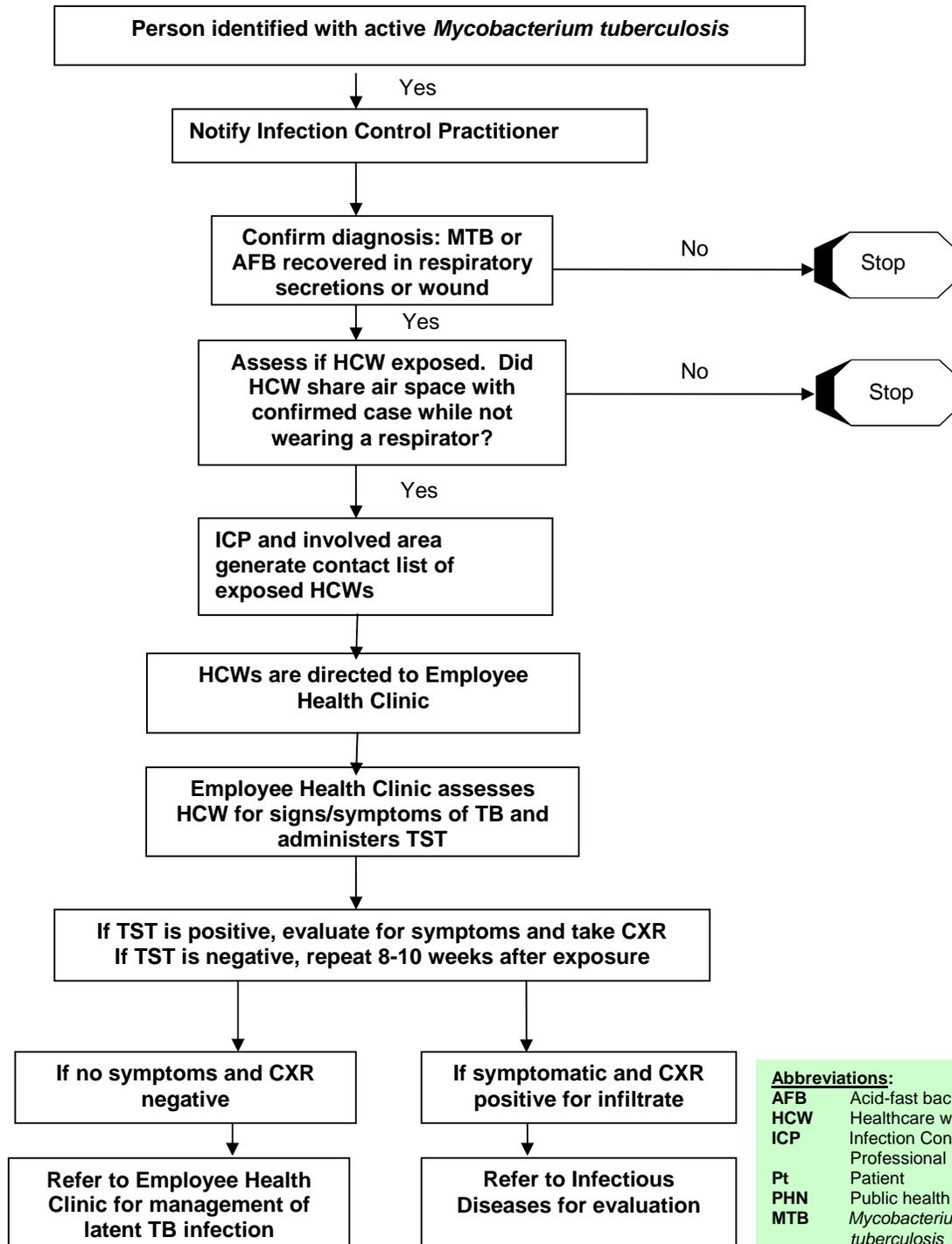
**Abbreviations:**  
**HCW** Healthcare Workers  
**ICP** Infection Control Practitioner  
**IgG** Immunoglobulin G  
**IgM** Immunoglobulin M  
**Pt** Patient  
**\*** Refer to page 138

Appendix 4-VI-09: Mumps Exposure



**Abbreviations:**  
**HCW** Healthcare Workers  
**ICP** Infection Control Practitioner  
**IgG** Immunoglobulin G  
**IgM** Immunoglobulin M  
**Pt** Patient  
**\*** Refer to page 139

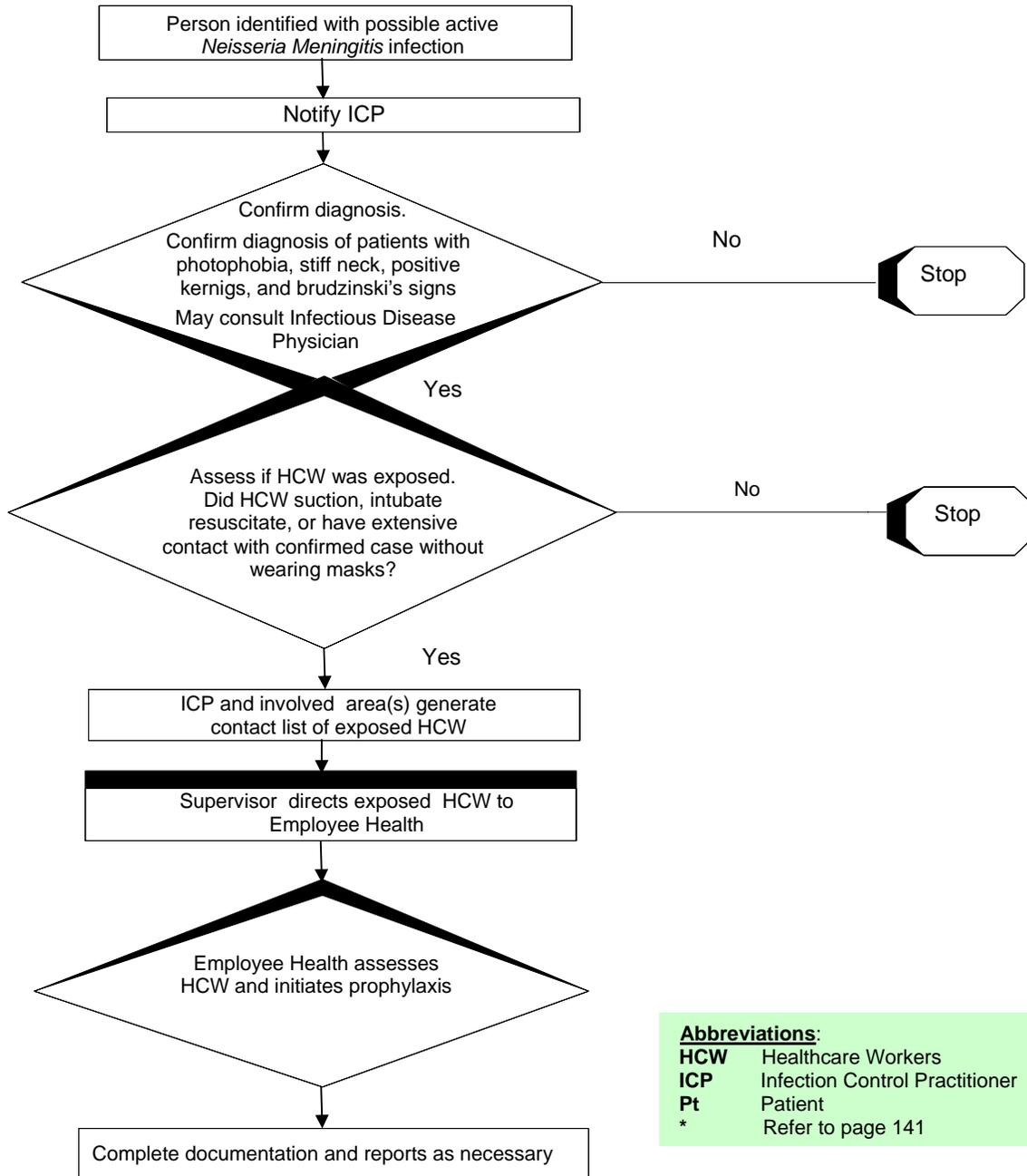
Appendix 5-VI-09: Mycobacterium Tuberculosis Exposure



**Abbreviations:**

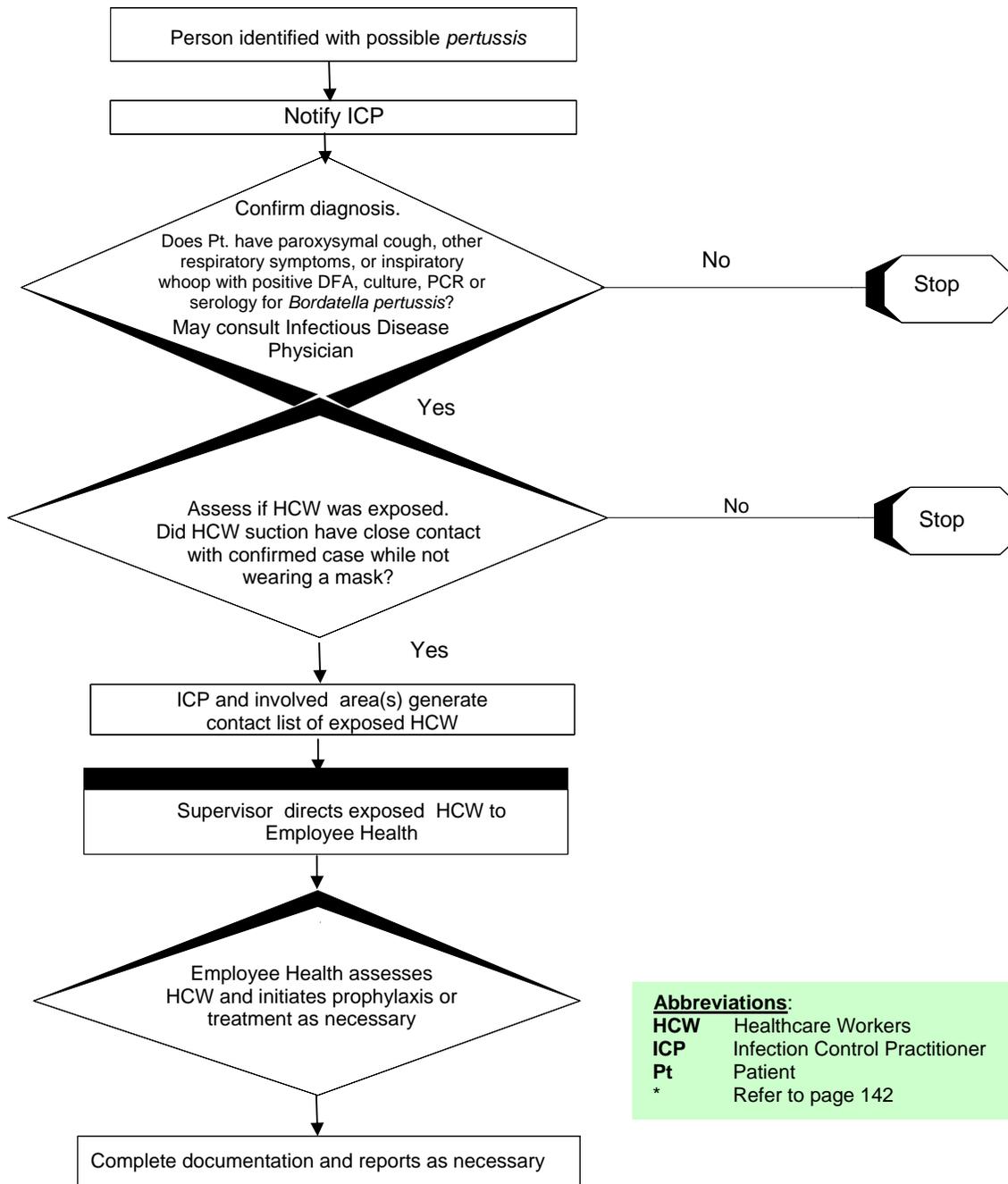
<b>AFB</b>	Acid-fast bacilli
<b>HCW</b>	Healthcare worker
<b>ICP</b>	Infection Control Professional
<b>Pt</b>	Patient
<b>PHN</b>	Public health nurse
<b>MTB</b>	<i>Mycobacterium tuberculosis</i>
<b>PPD</b>	Purified Protein Derivative
*	Refer to Page 140

Appendix 6-VI-09: *Neisseria Meningitis* Exposure



**Abbreviations:**  
**HCW** Healthcare Workers  
**ICP** Infection Control Practitioner  
**Pt** Patient  
**\*** Refer to page 141

Appendix 7-VI-09: *Bordatella Pertussis* Exposure



**Abbreviations:**

**HCW** Healthcare Workers  
**ICP** Infection Control Practitioner  
**Pt** Patient  
**\*** Refer to page 142

TITLE/DESCRIPTION: <b>MANAGEMENT OF PEDICULOSIS AND SCABIES EXPOSURE FOR HEALTHCARE WORKERS</b>		INDEX NUMBER: <b>ICM – VI-10</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines for the management or diagnosis healthcare workers (HCWs) exposed to scabies and pediculosis (lice).

## REFERENCE

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 92: Parasites. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Herwaldt LA, et al. Exposure workups. *Infection Control Hosp Epidemiol* 2009;18:850-71. IPP: Management of Infectious Disease Outbreaks.

## COMMENTS

1. The Employee Health Clinic (EHC) will assess HCWs who were exposed for prophylaxis, treatment and work exclusion and will notify Infection Control of any actions taken. When the EHC is closed, HCWs should seek medical attention in the Emergency Room. Expert consultation may be obtained from infection control practitioner on weekdays or from the Infectious Disease Consultant-on-call during weekends and holidays.
2. Management of the following conditions is outlined:
  - a. Scabies
  - b. Pediculosis (Lice)

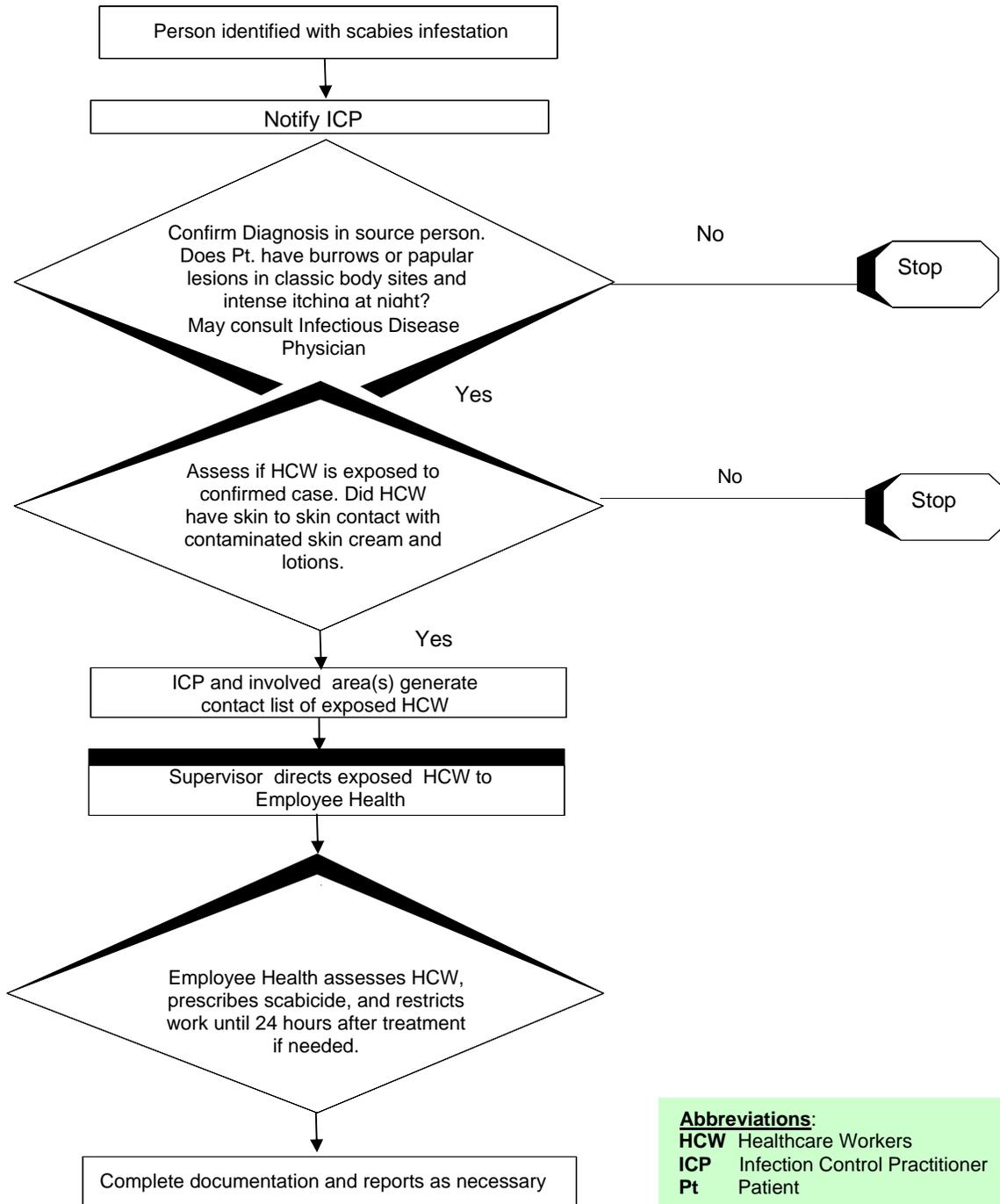
## A. MANAGING SCABIES EXPOSURE

1. **PROCEDURE:** Refer to [Appendix 1–VI-10](#), page 152.
2. **EXPLANATION:**
  - a. Incubation period  
During 4-6 weeks if no previous infestation; 1-3 days in cases of re-infestation.
  - b. Exposure criteria  
Direct skin-to-skin contact; minimal direct contact with crusted scabies can result in transmission.
  - c. Period of communicability
    - Transmission can occur before the onset of symptoms.
    - A person remains infectious until treated.
  - d. Employee health
    - Prescribe scabicide for all exposed HCWs.
    - Do not use Lindane for pregnant women.
  - e. Work restrictions
    - *Exposed:* No restriction after one application of scabicide
    - *Infested:* Immediate restriction for 24 hours following treatment
  - f. Prophylaxis  
Drug of choice: 5% permethrin; alternative drugs: lindane or crotamiton.

**B. MANAGING PEDICULOSIS (LICE) EXPOSURE**

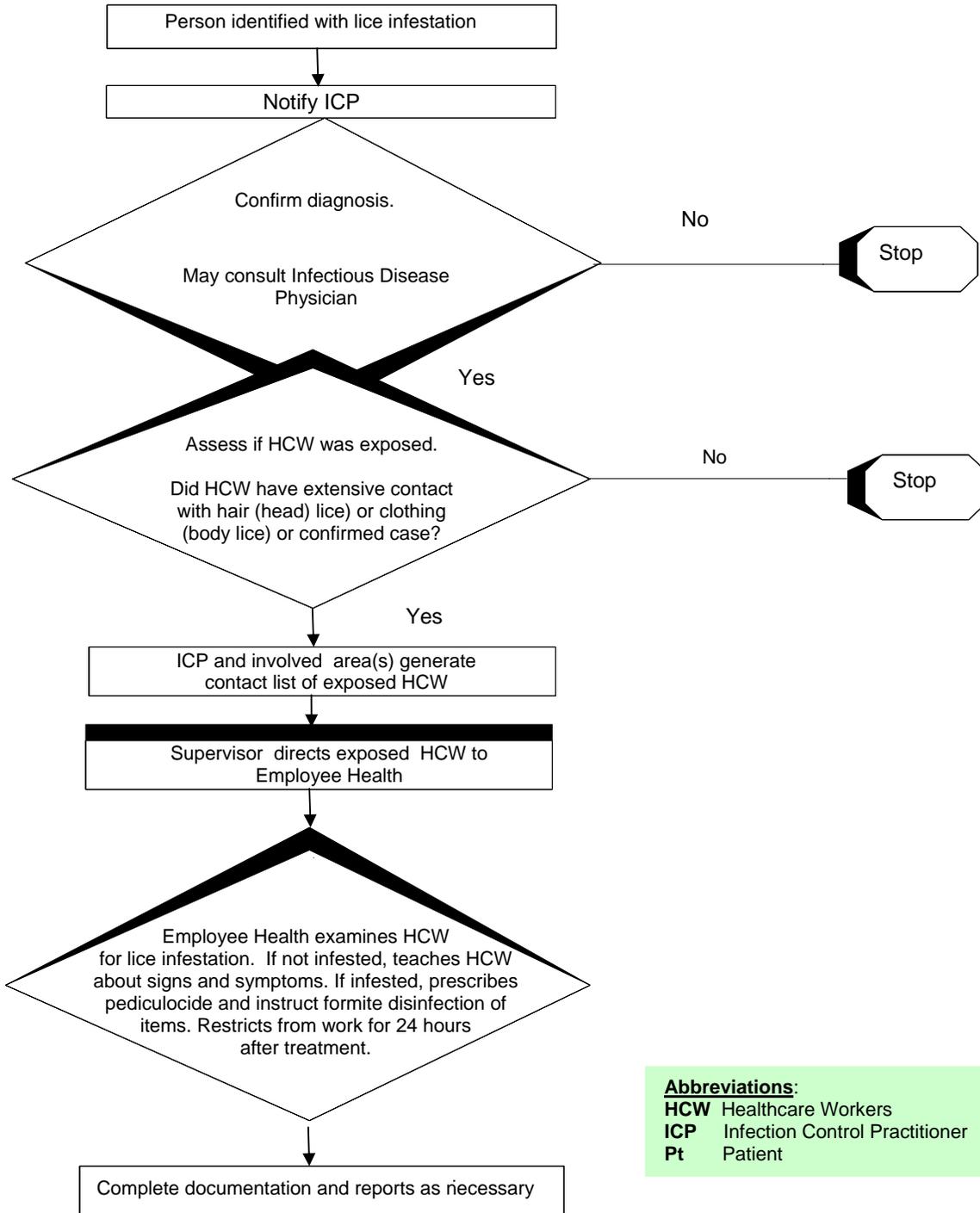
1. **PROCEDURE:** Refer to [Appendix 2–VI-10](#), page 153.
2. **EXPLANATION:**
  - a. Incubation period  
7-10 days.
  - b. Exposure criteria
    - **Head lice:** hair-to-hair contact with an infested person. Sharing of personal items such as hats, helmets, brushes, combs and headsets, or earphones.
    - **Body lice:** contact with the bedding or clothes of an infested person without wearing gloves.
    - **Pubic lice:** sexual contact.
  - c. Period of communicability
    - As long as lice or eggs remain alive on an infested person, clothing, or personal items.
    - Head lice die within 24 to 48 hours after leaving a host.
    - Body lice may survive for up to 30 days in a patient's clothing or linen.
    - Survival time for lice away from the host ranges between 2 days and 1 month.
  - d. Employee health  
Treat HCWs only if infested.
  - e. Work restrictions
    - *Exposed*  
No restrictions.
    - *Infested*  
Immediate restriction until 24 hours after treatment
  - f. Prophylaxis  
Not recommended.

Appendix 1 – VI-10: Scabies Exposure



**Abbreviations:**  
**HCW** Healthcare Workers  
**ICP** Infection Control Practitioner  
**Pt** Patient

Appendix 2 – VI-10: Pediculosis (Lice) Exposure



**Abbreviations:**  
**HCW** Healthcare Workers  
**ICP** Infection Control Practitioner  
**Pt** Patient

TITLE/DESCRIPTION: <b>MANAGEMENT OF OCCUPATIONAL EXPOSURE TO HBV, HCV, and HIV</b>		INDEX NUMBER: <b>ICM – VI-11</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide the guidelines for the management of healthcare workers who have had an occupational exposure to blood and/or body fluids.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 26: Occupational health. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Centers for Disease Control and Prevention (CDC). For edition U.S. Public Health Service guidelines for the management of occupational exposures to HBV, HCV and HIV and recommendation for post exposure prophylaxis, *MMWR* 2001/50 O (RR11);1-42
3. Centers for Disease Control and Prevention (CDC). For edition U.S. Public Health Service guidelines for public health service; guidelines for the management of occupational exposures to HIV; and, recommendation for post exposures prophylaxis. *MMWR* 2005; 54 (RR-09);1-17

## COMMENTS

1. Occupational exposure is defined as percutaneous injury (e.g., a needlestick or cut with sharp object) or contact of mucous membranes (e.g., splashes to eyes, nose, oral cavity) or non-intact skin (e.g., exposed skin that is chapped, abraded or afflicted with dermatitis) that may place the healthcare worker (HCW) at risk for infection with Hepatitis B virus (HBV), Hepatitis C virus (HCV) or human immunodeficiency virus (HIV).
2. Any direct contact (i.e., contact without barrier protection) to concentrated virus in a research laboratory or production facility is considered an exposure that requires clinical evaluation.
3. Potentially infectious materials include blood, body fluids containing visible blood, and tissue as well as medical supplies, equipment or environmental surfaces contaminated with these substances.
4. The following fluids are considered potentially infectious: cerebrospinal fluid, synovial fluid, pleural fluid, pericardial and amniotic fluids, semen, and vaginal secretions.
  - a. Feces, saliva, sputum, nasal secretions, sweat, tears, urine and vomit are not considered potentially infectious unless they contain blood.

## PROCEDURE

- A. Any exposed HCW should report immediately to the Employee Health Clinic during working hours or to the Emergency Department (ED) after hours or over the weekend. The HCW should report the incident to his/her supervisor. An Occurrence, Variance, and Accident (OVA) report form should be completed.

- B.** The employee should adhere to the following steps immediately post exposure
1. First Aid  
If you experienced a needlestick or sharps injury or were exposed to the blood or other body fluid of a patient during the course of your work, immediately follow these steps:
    - a. Percutaneous injuries
      - i. Wash needle sticks and cuts with soap and water.
      - ii. Then apply isopropyl alcohol 70%
      - iii. Bandage appropriately
    - b. Mucocutaneous and non intact skin exposures
      - i. Flush splashes to the nose, mouth, or non-intact skin with water.
      - ii. Irrigate eyes with clean or sterile water or saline.
      - iii. Flush site for 10 minutes.
  2. Reporting the Injury
    - a. The employee should report the incident to his/her supervisor and complete an Occurrence, Variance, and Accident (OVA) form.
    - b. The report should include:
      - i. The date and time of the incident
      - ii. The location where the incident occurred
      - iii. The department where the employee works
      - iv. The source patient Medical Record Number (MRN), if known
- C.** The physician evaluating the exposure should obtain the following information:
1. The name and identification of the source.
  2. The time and date of the exposure.
  3. The nature of the exposure (i.e., non-intact skin, mucosal or percutaneous, human bite).
  4. The type of fluid involved (i.e., blood, blood-contaminated fluid, or other contaminated fluid).
  5. The body location of the exposure and the contact time with the contaminated fluids.
  6. Infection status of the source (i.e., HIV, HCV, HBsAg). If known, include the date of testing.
  7. The exposed HCW should be questioned about the circumstances of the exposure:
    - a. For percutaneous injuries, the depth of the wound, solid versus hollow needle, sharps use in the source patient.
    - b. HBV immunization and post-immunization titer, if known (the HCW's medical records can be reviewed to ascertain this information).
    - c. Previous testing for HIV, HBV, and HCV.
    - d. Tetanus immunization status.
    - e. Current medical condition.
- D.** The exposed HCW's blood should be tested for HBV, HCV and HIV. Follow institutional policies for consent requirements to obtain the source patient's blood for testing.
- E.** The source individual's blood should be tested as soon as possible to determine HBV (HBsAg, HBsAb, anti-HBc), HCV (anti-HCV), and HIV (HIV test) serological status. When the source individual is already known to be infected with HCV or HIV, testing the source need not be repeated.
1. The nurse will notify the patient's most responsible physician (MRP) of the incident.
  2. It is the responsibility of the MRP to order the following baseline serology on the source patient after obtaining consent:
    - a. HBsAg
    - b. Anti-HCV
    - c. Anti-HIV I/II

- F. Counsel the employee regarding the risk of transmission of bloodborne pathogens and post-exposure prophylaxis.
- G. HBV post-exposure prophylaxis (PEP) is determined by the HBsAg status of the source and the immune status of the exposed person.
- H. Recommended post-exposure prophylaxis for exposure to hepatitis B virus
  - 1. Post-exposure prophylaxis with Hepatitis B immunoglobulin (HBIG) and/or vaccine should be administered as soon as possible (preferably within 24 hours).
    - a. The effectiveness of HBIG when administered more than 7 days after percutaneous or mucosal exposure is unknown.
    - b. If the exposed person has an adequate antibody response (>10 mIU/ml) documented after completion of an HBV vaccination series, no testing or treatment is needed.
    - c. Hepatitis B vaccine and HBIG can be administered simultaneously at separate sites (the vaccine should always be administered in the deltoid muscle).

Table 1 – VII-04

**Recommended Post-Exposure Prophylaxis (PEP) for Hepatitis B Virus**

Employee Status	Source Patient Status		
	HBsAg Positive	HBsAg Negative	Unknown
Unvaccinated	HBIG*x1 and initiate HB vaccine series.	Initiate HB vaccine series.	Initiate HB vaccine series.
Previously vaccinated	No treatment	No treatment	No treatment
a. Known responder <sup>+</sup>			
b. Known non-responder <sup>++</sup>	HBIG*x2 or HBIG*x1 and initiate revaccination.	No treatment	If known high-risk source, treat as if source were HBsAg positive.
Antibody response unknown	Test exposed person for anti-HBs: 1. if adequate <sup>+</sup> , no treatment 2. if inadequate <sup>++</sup> , HBIGx1 and vaccine booster.	Test exposed person for anti-HBs: 1. if adequate <sup>+</sup> , no treatment 2. if inadequate <sup>++</sup> , initiate vaccination	Test exposed person for anti-HBs: 1. if adequate <sup>+</sup> , no treatment 2. if inadequate <sup>++</sup> , initiate vaccination

**Legend:**

- HBsAg: Hepatitis B surface antigen.
- HBIG: Hepatitis B immunoglobulin.
- HB vaccine: Hepatitis B vaccine to be given IM in the deltoid muscle.
- Anti-HBs: Antibody to hepatitis B surface antigen.
- \* Dose: 0.06 mg/kg IM to be administered at a different site from the HB vaccine, using a different syringe.
- + A responder is defined as a person with adequate serum levels of anti-HBs (> 10 mIU/ml) tested 1-2 months after vaccine completion.
- ++ A non-responder is defined as a person with serum anti-HBs levels < 10 mIU/ml, as tested 1-2 months after vaccine completion (2 series).

- I. HCV Infection: Persons exposed to an HCV-positive source should have the following baseline and follow-up testing
  - 1. Baseline testing for anti-HCV, HCV RNA and ALT.
  - 2. Follow-up testing for HCV RNA 4 to 6 weeks after exposure.
  - 3. Follow-up testing for anti-HCV, HCV RNA and ALT 4 to 6 months after exposure.
  - 4. No post-exposure prophylaxis is currently recommended for HCV.

- J. HIV post-exposure prophylaxis (PEP): Refer to [Table 2-VII-04](#) and [Table 3-VII-04](#).
1. These recommendations apply to situations in which the HCW has been exposed to a source person who either has or is considered likely to have HIV.
  2. If PEP is offered and taken and the source is later determined to be HIV negative, PEP should be discontinued.
  3. The majority of occupational exposures do not result in transmission of HIV. The exposed HCW should be counseled about the risk of transmission based on the severity, volume, route of exposure, and viral load of the HIV source and the potential toxicity of anti-retroviral agents.
  4. The average risk for HIV transmission after percutaneous exposure to HIV-infected blood has been estimated to be approximately 0.3 percent and approximately 0.09 percent after mucous membrane exposure.
  5. The average risk of HIV transmission after non-intact skin exposure is less than the risk for mucous membrane exposure.
  6. Exposure of source blood to intact skin is considered no risk; however, any direct contact without barrier protection to concentrated virus in a research laboratory requires clinical evaluation.
  7. The risk for transmission after exposure to fluids or tissues other than HIV-infected blood is likely to be considerably lower than that for blood exposure.
  8. PEP should be initiated as soon as possible, preferably within hours or up to 24 to 36 hours after exposure. The benefit of PEP is greatly diminished after 24 to 36 hours.
  9. Persons receiving PEP should complete a full 4-week regimen. Obtain baseline HIV levels and CBC with differential liver and renal profile, and then re-evaluate clinically 72 hours post-PEP initiation and at 2 and 4 weeks after the initiation of PEP.
  10. HIV serological screening should be performed at baseline and 6 weeks, 12 weeks and 6 months following the exposure, unless the source tests negative for HIV infection.
  11. Refer any HCW identified with an HIV infection to specialty care
  12. The recommendation to consider PEP should indicate that it is optional; a decision to initiate PEP should be based on a discussion between the exposed person and the treating clinician regarding the risks versus benefits of PEP.
  13. If PEP is offered and administered and the source is later determined to be HIV-negative, PEP should be discontinued.
  14. HIV PEP Regimens:
    - a. Basic 2-drug regimen
      - i. Zidovudine (ZDV), 300 mg twice per day PLUS Lamivudine (3TC), 300 mg once per day or
      - ii. Combivir (ZDV + 3TC), 1 tablet twice per day
    - b. Alternative drug regimens (used for high-risk exposure)
      - i. Kaletra, 2 tablets twice per day PO PLUS ZDV, 300 mg PO twice per day PLUS 3TC, 300 mg once per day PO or
      - ii. Kaletra, 2 tablets twice per day PO PLUS Combivir, 1 tablet PO twice per day

Table 2 – VII-04

**Recommended HIV Post-Exposure Prophylaxis (PEP) for Percutaneous Injuries**

Exposure Type	HIV Positive Class 1	HIV Positive Class 2	Source of unknown HIV status	Unknown Source	HIV Negative
Less Severe	Recommend basic 2-drug PEP	Recommend expanded ≥3 drug PEP	Generally, no PEP warranted; however, consider basic 2-drug PEP for sources with HIV risk factors	Generally, no PEP warranted; however, consider basic 2-drug PEP in settings in which exposure to HIV-infected persons is likely	No PEP warranted
More severe	Recommend expanded ≥3-drug PEP	Recommend expanded ≥3-drug PEP	Generally, no PEP warranted; however, consider basic 2-drug PEP for sources with HIV risk factors	Generally, no PEP warranted; however, consider basic 2-drug PEP in settings in which exposure to HIV-infected persons is likely	No PEP warranted

Legend:

**HIV positive, class 1: asymptomatic HIV infection or known low viral load (i.e., <1,500 RNA copies/ml)**

**HIV positive, class 2: symptomatic HIV infection, acquired immunodeficiency syndrome, acute seroconversion, or known high viral load.**

Table 3 – VII-04

**Recommended HIV Post-Exposure Prophylaxis (PEP) for mucous membrane exposure and non-intact skin exposure**

Exposure Type	HIV Positive Class 1	HIV Positive Class 2	Source of unknown HIV status	Unknown Source	HIV Negative
Small volume	Consider basic 2-drug PEP	Recommend basic 2-drug PEP	Generally, no PEP warranted	Generally, no PEP warranted	No PEP warranted
Large Volume	<b>Recommend basic 2-drug PEP</b>	Recommend expanded ≥3-drug PEP	Generally, no PEP warranted; however, consider basic 2-drug PEP for sources with HIV risk factors	Generally, no PEP warranted; however, consider basic 2-drug PEP in settings in which exposure to HIV-infected persons is likely	No PEP warranted

**K. Counseling for employees exposed to viral hepatitis and HIV for the duration of the follow-up:**

1. Refrain from donating blood, semen, plasma or tissue.
2. Pregnant or lactating women should be advised against breast feeding.
3. Personal items such as toothbrushes and razors should not be shared.
4. Sexual intercourse should involve protection.

## Section 7: INFECTION CONTROL POLICIES IN SPECIAL SITUATIONS

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TITLE/DESCRIPTION: <b>MANAGEMENT OF INFECTIOUS DISEASE OUTBREAKS</b>		INDEX NUMBER: <b>ICM – VII-01</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines to manage an infectious disease outbreak in the hospital, including early identification, initiation of appropriate control/containment measures to prevent the spread, and assigned responsibilities.

## EQUIPMENT/MATERIAL

1. Microbiology and other relevant daily/weekly reports.
2. Data collection forms (computer program compatible).

## COMMENTS

1. An outbreak (cluster, epidemic) is an increase in the incidence of a particular infection or colonization over the expected rate.
2. Epidemic associated infections are often clustered temporally or geographically suggesting that the infection are from a common source or are secondary to person to person transmission and are associated with specific device or procedure.
3. The efficient and effective control of an outbreak requires a multidisciplinary effort with well-defined responsibilities for all stakeholders.

## PROCEDURE

Activity	Responsible Person(s)
Notify the Director of Infection Control or designee of a potential outbreak.	Infection Control Practitioner (ICP)
Identify patient and healthcare worker contacts of cases.	ICP, Nurse Manager/Designee
Identify cases, verify the diagnosis, and search for additional cases.	Attending Physician(s), Nurse Manager/Charge Nurse, ICP, Employee Health Clinic, Microbiology Laboratory
Conduct epidemiological investigation and institute isolation and barrier precautions to assess source(s), pathogen(s) and the mode of transmission.	ICP
Notify Microbiology Laboratory of need for diagnostic tests.	ICP

Activity	Responsible Person(s)
Establish an ad-hoc committee to manage the potential outbreak.	Director of Infection Control, infection control staff, and Director of Nursing Services, and others as deemed necessary
Advise Hospital Administration.	Director of Infection Control/Designee
Inform and assess patient contacts for prophylaxis.	Attending Physician, infection control staff, Director of Infection Control/Designee
Direct HCWs to the Employee Health Clinic for assessment.	Infection control staff (for physicians), Nurse Manager (for other healthcare workers)
Assess HCWs for prophylaxis and work exclusion.	Employee Health Clinic
Designate infected and non-infected cohort areas as required. Move infected cohort to an alternate location as determined by census, patient status, and admitting needs.	Director of Infection Control/Designee, ICP, Director of Nursing Services, Department Chairman
Declare unit/ward closure if necessary.	Director of Infection Control/Designee in consultation with Hospital Administration and Department Chairman and Director of Nursing Services

TITLE/DESCRIPTION: <b>MANAGEMENT OF INTRAVASCULAR (IV) LINES AND THERAPY</b>		INDEX NUMBER: <b>ICM – VII-02</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

The purpose of this policy is to provide guidelines regarding appropriate catheters and catheter sites, aseptic insertions, and maintenance of catheter sites.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 24: Intravascular device infection. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 43: Burns. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
3. Centers for Disease Control and Prevention (CDC). Guidelines for preventing the transmission of mycobacterium tuberculosis in healthcare settings. *MMWR*, 2005.
4. Centers for Disease Control and Prevention (CDC). Guideline for prevention of intravascular device-related infections. Recommendations and reports, *MMWR*, 2002/51(RR10)
5. Infection Prevention and Control Manual, [ICM-II-04 Hand Hygiene](#)

## COMMENTS

1. Intravascular devices (IVD) are an integral part of patient care. They offer a means of direct access to the patient's vascular system for the administration of pharmaceutical agents or fluids that cannot be administered as effectively by other means.
2. Central venous catheter (CVC) may be used to access the great veins for infusion of irritant solutions or to facilitate hemodynamic monitoring. Central venous lines are also used to provide prolonged venous access.
3. All lines provide a potential portal of entry for microorganisms to enter the vascular system and cause local or systemic infectious complications such as septic thrombophlebitis, bloodstream infections, and metastatic infections. Catheter-related infections are associated with increased morbidity, mortality, medical costs and prolonged hospitalization. The following recommendations, if followed, will reduce the occurrence of catheter-related infections.
4. Follow IVD care protocols and maintain a consistent, high level of aseptic technique during catheter insertion; HCWs must adhere strictly to all care protocols during follow-up care of the catheter.
5. Ensure all necessary equipment is present for IV or CVC insertion by creating a checklist before the procedure.

## PROCEDURE

### A. Hand hygiene

1. Perform hand hygiene prior to device insertion and subsequent handling of the device or its administration, such as before and after palpating, inserting, replacing, or dressing the device.

### B. Healthcare worker safety (Standard Precautions)

1. Wear sterile gloves to avoid sharps injury and protect hands against blood and body fluid exposure.
2. Wear a surgical mask with an eye shield or goggles to protect against any potential blood or body fluid splash onto the mucous membranes of the face.
3. Do not manipulate or recap used needles and promptly dispose of them into hospital-approved sharps containers kept near the location of the procedure.

### C. Catheter site care

1. Skin preparation
  - a. Prepare an adequately large area of skin from the selected site for insertion.
  - b. Prepare the skin with an appropriate antiseptic approved by Infection Prevention and Control department (IP&C). A 2% chlorhexidine/70% alcohol antiseptic solution is recommended to disinfect the skin for line insertion. NB: Use 2% chlorhexidine aqueous solution swab packs on neonates <2 weeks old and <1500 gms.
    - i. Start at the intended puncture site and scrub the entire site with back-and-forth movements for 30 seconds.
    - ii. Let the solution remain on the insertion site until air dried before catheter insertion; do not blot or wipe off.
    - iii. Do not palpate the insertion site after the skin has been prepared with antiseptic unless the practitioner is employing maximum barrier precautions in a sterile field and maintains asepsis.
  - c. Alternative antiseptics include alcohol and 10% povidone-iodine can be used on patients if chlorhexidine is contraindicated. Follow this procedure when using alcohol and iodine swabs for skin antiseptics:
    - i. First, cleanse the skin with an alcohol swab to remove surface contaminants as much as possible.
    - ii. Start at the intended puncture site and continue outward in a circular motion for about 2 inches.
    - iii. Apply iodine tri-pack swabs in the same manner and allow for drying approximately 2 minutes. The bacteriostatic effect of iodine is directly proportional to the length of time it is allowed to remain in contact with the skin.
    - iv. Do not palpate the insertion site after the skin has been prepared with antiseptic unless the practitioner is employing maximum barrier precautions in a sterile field and maintains asepsis.
2. Catheter site dressings
  - a. Cover the catheter site with sterile gauze or a transparent dressing. A sterile transparent semi-permeable polyurethane film dressing is recommended on peripheral IVs and short-term CVCs. Use sterile gauze and tape dressing if site is oozing. The use of polyurethane film dressing is discouraged on long-term arterial catheters.
  - b. Replace the dressing when the intravascular device is removed or replaced or when the dressing becomes damp, loosened, or soiled. Do not change dressings at routinely scheduled intervals.
  - c. Avoid touch contamination of the catheter site when the dressing is replaced.

**D. Replacement of Administration Sets and Intravenous Fluids**

1. Administration sets
  - a. Review and remove the IVD as soon as it is no longer required. Monitor sites for signs of infection.
  - b. Replace IV tubing, including piggyback tubing and stopcocks, every 72 to 96 hours unless clinically indicated. This recommendation applies when crystalloid solutions are being infused.
  - c. Replace the tubing used to administer blood, blood products, lipid emulsions, or dextrose/amino acid TPN solutions within 24 hours of initiating the infusion.
  - d. Replace sets used to administer propofol every 12 hours.
  - e. Replace all IV delivery systems every 24 to 48 hours during an epidemic of infusion-associated BSI.
2. Parenteral fluids
  - a. Complete infusions of total parenteral nutrition fluids (dextrose/amino acid solutions or dextrose/amino acid solutions combined with lipid emulsions) within 24 hours of hanging the fluid bag.
  - b. Lipid emulsions alone should be completed within 12 hours of starting or as instructed by the pharmacy.
  - c. Propofol should be completed within 12 hours if the drug is used directly from the prefilled syringe or vial. If propofol is transferred to a syringe or another container prior to administration, the drug should be completed within 6 hours. Tubing and any unused portions of propofol vials should be discarded after the recommended duration.
  - d. Change crystalloid solutions every 72 hours.

**E. Intravenous injection ports**

1. Disinfect the injection ports, catheter hubs, and needless connectors with chlorhexidine solution or 70% alcohol before accessing the system to reduce contamination.

**F. Preparation and quality control of intravenous admixtures**

1. Mix all parenteral fluids in the Pharmacy only.
2. Check all containers of parenteral fluid for visible turbidity, leaks, cracks, particulate matter, and the manufacturer's expiration date before use.
3. Use single-dose vials for parenteral additives or medications whenever possible.
4. If multidose vials are used:
  - a. Note the date and time on the multidose vials once opened.
  - b. Refrigerate the multidose vial after opening if recommended by the manufacturer.
  - c. Cleanse the rubber diaphragm of the multidose vial with alcohol before inserting a device into the vial.
  - d. Use a sterile device each time a multidose vial is accessed and avoid touch contamination of the device prior to penetrating the rubber diaphragm.
  - e. Discard multidose vials when suspected or visible contamination occurs, when the manufacturer's expiration date is reached, or when the nursing policy expiration date is reached.

### G. Documentation

Document the following information for all procedures related to IV therapy in the patient's records:

- a. Date and time of insertion.
- b. Type of device used and site of insertion.
- c. Type of fluid administered.
- d. Name(s) of person(s) who inserted the device.
- e. Date and time of device termination or guidewire exchange.

### H. Microbial culturing for suspected infections

Catheter tip cultures

- a. Catheter tip culturing should only be performed if catheter-related infection is suspected. It is not a routine clinical procedure.
- b. Remove the cannula using aseptic technique to avoid contamination.
- c. Using sterile scissors cut the catheter approximately 1 cm from the tip and place the segment in a sterile container.
- d. Send the catheter tip segment to the microbiology lab for semi-quantitative culture as soon as possible.

## SPECIFIC PROCEDURES

### A. Peripheral Venous Catheters

1. Site selection:
  - a. In adults, an upper extremity site is preferred to a lower extremity site. Catheters inserted in the lower extremities should be transferred to the upper extremities as soon as possible.
  - b. In children, insert catheters in the scalp, hand, or foot rather than the leg, arm, or antecubital fossa.
2. Barrier precautions during catheter insertion
  - a. With the "no-touch" technique, using a new pair of disposable non-sterile gloves is adequate for inserting a peripheral IV catheter. However, sterile gloves should be used during insertion in high-risk patients.
3. Catheter replacement
  - a. In adults, peripheral IVs may safely be left in place for as long as 96 hours if the patient and the insertion site are monitored closely.
  - b. Catheters inserted under emergency conditions with possible breaks in aseptic technique should be removed within 24 hours, and a new catheter should be inserted at a different site.
  - c. Remove peripheral venous catheters when the patient develops signs of phlebitis (warmth, tenderness, redness, palpable venous cord).
  - d. No recommendation for the frequency of replacement of short peripheral venous catheters specifically in the pediatric population can be gathered from the medical literature.
    - i. Given the often limited sites for intravascular access in pediatric patients, a determination must be made by the patient's nurse or physician that the benefit of maintaining a well functioning catheter with no signs of infection outweighs the risk of leaving it in place for more than 72 to 96 hours.
    - ii. The patient and IV site should be examined closely thereafter for early signs of infection.
    - iii. Any catheter inserted under emergency conditions in which breaks in aseptic technique are likely to have occurred should be removed within 24 hours of use, and a new catheter should be inserted at a different site.

4. Catheter and catheter site care
  - a. Routinely flush peripheral venous heparin locks with normal saline, unless they are used for obtaining blood specimens, in which case a dilute heparin (10 units per mL) flush solution should be used.
  - b. Do not routinely apply topical antimicrobial ointments to the insertion site of peripheral venous catheters to prevent infection.

## B. Central Venous Catheters and Arterial Catheters

1. Catheter selection
  - a. Use single-lumen central venous catheters unless multiple ports are essential for patient care.
  - b. In patients  $\geq 4$  years of age for whom vascular access is required for  $>30$  days, use a peripherally inserted central venous catheter, a tunneled catheter (e.g., Hickman or Broviac), or an implantable vascular access device (e.g., Port-a-Cath). Although the use of a totally implantable access device (e.g., Port-a-Cath) has been recommended for younger pediatric patients (age  $<4$ ) who require long-term vascular access secondary to a lower rate of infection when compared to a tunneled catheter, such devices should not be used if frequent or continuous use of the device is anticipated.
  - c. In neonates, consider using a peripherally inserted venous catheter (PICC), umbilical venous catheter (UVC), or umbilical arterial catheter (UAC).
2. Site selection
  - a. Weigh the risks and benefits of placing a device at a recommended site to reduce infectious complications against the risk of mechanical complications (e.g., pneumothorax, subclavian artery puncture, thrombosis, hemothorax).
  - b. Where risk of infection is the primary consideration in the selection of an insertion site and no medical contraindications (e.g., coagulopathy and anatomic deformity) exist, the subclavian site is preferred over the jugular or femoral sites in adults.
  - c. If a femoral vascular access is used, the catheter should be located at least two inches below the inguinal crease when possible.
  - d. The internal jugular vein is the recommended central access site for hemodialysis prior to establishment of arterial venous fistula.
  - e. In neonates, the umbilicus is the preferred site for central venous or arterial line access.
3. Barrier precautions during catheter insertion
  - a. Use maximum barrier precautions, which include a sterile gown and gloves, a surgical mask, and a large sterile drape for inserting UAC, UVC, central venous and pulmonary artery catheters. Use these precautions even if the catheter is inserted in the operating theater. Maintain a consistent, high level of aseptic technique during the procedure.
  - b. To insert an arterial catheter for hemodynamic monitoring, use sterile gloves and a sterile fenestrated drape, maintaining a high level of aseptic technique.
4. Catheter replacement
  - a. Short-term CVC do not need scheduled replacement if they are functioning well and show no clinical signs of infection.
  - b. Guidewire exchange:
    - i. Use maximum barrier precautions (sterile gown and gloves, surgical mask, and a large sterile drape) during guidewire exchanges.
    - ii. Use guidewire-assisted catheter exchange to replace a malfunctioning catheter or to convert an existing catheter if there is no evidence of infection at the catheter site.

- iii. If catheter-related infection is suspected but there is no evidence of local catheter-related infection (e.g., purulent drainage, redness, tenderness), remove the existing catheter and insert a new catheter over the guidewire. Send the 1-cm tip of the removed catheter for semi-quantitative culture. Leave the newly inserted catheter in place if the catheter culture is negative. If the catheter culture indicates colonization or infection, remove the newly inserted catheter and insert a new catheter at a different site.
  - iv. Do not use guidewire-assisted catheter exchange whenever catheter-related infection is documented. If the patient requires continued vascular access, remove the implicated catheter and replace it with another catheter at a different insertion site.
5. Catheter and catheter site care
- a. General measures:
    - i. Do not use single-lumen parenteral nutrition catheters for purposes other than hyperalimentation.
    - ii. If a multi-lumen catheter is used to administer parenteral nutrition, designate one port for hyperalimentation. Do not use the hyperalimentation port for other purposes.
    - iii. In pediatrics, both trifuse and bifuse extensions can be used in conjunction with the port dedicated for hyperalimentation if no other options for additional access exist. However, the physician must balance the possibility of increased infection against the necessity of the potential therapy.
    - iv. Wipe the catheter hub with an appropriate antiseptic before accessing the system.
  - b. Flush solutions, anticoagulants, and other IV additives:
    - i. Routinely flush midline and PICC lines with normal saline and heparin before and after access.
    - ii. Routinely flush implanted central port (Port-a-Cath), tunneled central line (Groshong, Hickman, or Broviac) and Perm-a-Cath with normal saline before access; lock with heparin saline after infusion.
  - c. Skin antiseptics and antimicrobial ointments:
    - i. Do not routinely apply antimicrobial ointment to central venous catheter insertion sites.
    - ii. Do not apply organic solvents (e.g., acetone or ether) to the skin before the insertion of parenteral nutrition catheters.
  - d. Catheter site dressings
    - i. Replace catheter site dressings when the device is replaced, when the dressing becomes damp, loosened, or soiled, or when inspection of the site is necessary. Do not change dressings at routinely scheduled intervals.

### C. Central venous hemodialysis catheters

1. Catheter and catheter site care:
  - a. Use hemodialysis catheters solely for hemodialysis. Use of hemodialysis catheters for other purposes should be restricted to circumstances in which no alternative vascular access is feasible.
  - b. Restrict manipulations of the hemodialysis catheter, including dressing changes, to trained dialysis personnel.
  - c. Replace catheter site dressing at each hemodialysis session or when the dressing becomes damp, loosened, or soiled.
  - d. Use 10% povidone-iodine to clean the catheter insertion site at each dressing change.

**D. Peripheral Arterial Catheters and Pressure-Monitoring Devices**

1. Selection of pressure-monitoring system:
  - a. Use disposable transducer assemblies rather than reusable ones.
2. Replacement of catheter and pressure-monitoring system:
  - a. In adults, replace peripheral arterial catheters and relocate catheter insertion sites every 4 days for infection control purposes.
  - b. In pediatric patients, no recommendation for the frequency of replacement of peripheral arterial catheters can be made based on the medical literature.
    - i. However, following the adult recommendation of replacing peripheral arterial catheters and relocating catheter insertion sites no more frequently than every 4 days due to infection would be a prudent measure.
  - c. Replace disposable or reusable transducers at 96-hour intervals. Replace other components of the system, including the tubing and the continuous-flush device, at the time the transducer is replaced.
  - d. Replace the arterial catheter and the entire monitoring system if the patient develops “high-grade” (i.e., persistent) bacteremia while the catheter is in place, irrespective of the source of bacteremia. The catheter and monitoring system should be replaced 24 to 48 hours after antimicrobial therapy has been started.
3. Care of pressure-monitoring systems:
  - a. General infection prevention measures:
    - i. Do not contaminate the components of the pressure-monitoring circuit (including the calibration devices and flush solution). Use aseptic technique when handling the device.
    - ii. Minimize the number of manipulations and entries into the pressure-monitoring system. Use a closed-flush system (i.e., continuous flush) rather than an open system (i.e., one that requires a syringe and stopcock) to maintain the patency of the pressure-monitoring catheters. If stopcocks are used, treat them as a sterile field and cover them with a cap or syringe when not in use.
    - iii. When the pressure-monitoring system is accessed through a rubber diaphragm rather than a stopcock, wipe the diaphragm with an appropriate antiseptic before accessing the system.
    - iv. Do not administer dextrose-containing solutions or parenteral nutrition fluids through the pressure-monitoring circuit.
  - b. Sterilization or disinfection of pressure-monitoring systems:
    - i. Sterilize and disinfect reusable transducers according to the manufacturer’s instructions.
    - ii. Sterilize and disinfect transducers in a central processing area. Reprocess and disinfect reusable transducers in patient-care areas only in emergency situations.

TITLE/DESCRIPTION: <b>ANTIMICROBIAL SURGICAL PROPHYLAXIS</b>		INDEX NUMBER: <b>ICM – VII-03</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

Antimicrobial prophylaxis is used to reduce the incidence of postoperative wound infection and is generally indicated for the following types of operations:

Clean-contaminated: operative wound in which the respiratory, alimentary, genital, or urinary tract is entered under controlled conditions without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided that no evidence of infection or major break in technique is encountered.

Clean: non infected operative wounds in which no inflammation is encountered and the respiratory, alimentary, genital, or uninfected urinary tract is entered. Example, an intravascular prosthesis or prosthetic joint is inserted, cardiac operations, including pacemaker placement and vascular surgery, and most neurosurgical operations.

Antimicrobial prophylaxis is not indicated for an operation classified as dirty or contaminated. Additionally, the following points should be considered when using antimicrobial prophylaxis:

1. Neonatal doses are not included in this policy.
2. Prophylactic antibiotics should be administered within 30 minutes of surgical incision; if vancomycin or ciprofloxacin is used, the infusion should begin 60-120 minutes before the incision. All antibiotic administration must be complete at the time of surgical incision.
3. Antibiotics must be discontinued as per provided recommendations. Patients who have documented infections at the time of surgery or within 48 hours postoperatively should receive empiric therapy.
4. Administration should be repeated intraoperatively if the surgical procedure is prolonged (i.e., lasting more than 4 hours) or in the case of a major blood loss, as described below:

DRUG	SUPPLEMENTAL DOSE TIMING
Cefazolin	Every 4 hours
Clindamycin	Every 4 hours
Vancomycin	Every 8 hours
Metronidazole	Every 8 hours

Re-administration is not warranted in patients for whom the half-life of the antibiotic is prolonged (e.g., patients with renal failure).

5. Cefazolin is an appropriate first-line agent for most surgical procedures.
6. Routine use of vancomycin is discouraged.
7. Antibiotics should cover the predominant flora of the operative site: *Staphylococcus* and streptococci for most cases. Anaerobes and Enterobacteriaceae for GI cases.

8. In patients with penicillin and cephalosporin allergies, clindamycin or vancomycin may be used. Gentamicin or ciprofloxacin can be added if gram-negative coverage is required.

REFERENCES

1. Treatment guidelines antimicrobial prophylaxis for surgery. *The Medical Letter*, June 2009:7(82).
2. The John Hopkins Antimicrobial Guide: Diagnosis and Treatment of Infectious Diseases. (2010, 2<sup>nd</sup> ed.)
3. The Sanford Guide to Antimicrobial Therapy. (2010, 14<sup>th</sup> ed.)

PROCEDURES

SURGICAL PROCEDURE	COMMON PATHOGEN	RECOMMENDED REGIMEN	ALTERNATIVE REGIMEN
<p><u>Cardiac</u></p> <ul style="list-style-type: none"> <li>• Median sternotomy</li> <li>• Prosthetic valve placement</li> <li>• Coronary artery bypass</li> <li>• Congenital repairs</li> </ul> <ul style="list-style-type: none"> <li>• Pacemaker/AICD placement</li> <li>• Ventricular assist device</li> <li>• Arterial patch</li> <li>• Ventriculoatrial shunts</li> </ul>	<ul style="list-style-type: none"> <li>• Coagulase-negative <i>Staphylococcus</i></li> <li>• <i>Staphylococcus aureus</i></li> <li>• Enterobacteriaceae</li> </ul>	<p><i>Adult:</i> Cefazolin 1 g IV pre-op plus 1 gm IV Q 8 h x 24 hr post-op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg IV (max 1 gm) pre-op plus Q 8 h x 24 hr post-op</p> <p><i>Adult:</i> Cefazolin 1 gm IV pre-op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg (max 1 gm) IV pre-op</p>	<p><i>Adult:</i> Vancomycin 1g IV pre-op plus gm IV Q 12 h x 24 hr post-op plus Gentamicin 1.5 gm IV/kg pre-op plus 1.5 mg/kg IV Q 8-12 h x 24 hr post-op</p> <p><i>Pediatric:</i> Vancomycin 20 mg IV/kg (max 1 gm) pre-op Q 12 h x 24 h post-op plus Gentamicin 2 mg/kg IV pre-op plus Q 8 to 12 h x 24 hr post-op</p> <p><i>Adult:</i> Vancomycin 1 gm IV pre-op</p> <p><i>Pediatric:</i> Vancomycin 20 mg/kg (max 1 gm) IV pre-op</p>
<p><u>Thoracic Non-Cardiac</u></p> <ul style="list-style-type: none"> <li>• Pulmonary resection</li> </ul> <ul style="list-style-type: none"> <li>• Closed chest tube insertion for chest trauma with hemo- or pneumothorax</li> </ul>	<ul style="list-style-type: none"> <li>• Coagulase-negative <i>Staph</i></li> <li>• <i>Staphylococcus aureus</i></li> <li>• Enterobacteriaceae</li> </ul>	<p><i>Adult:</i> Cefazolin 1 gm IV pre-op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg IV (max 1 gm) pre-op</p> <p><i>Adult:</i> Cefazolin 1 gm IV pre-op plus Q 8 h x 24 hr post op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg (max 1 gm) IV pre-op Q 8 h x 24 hr post-op</p>	<p><i>Adult:</i> Clindamycin 600 mg IV pre-op</p> <p><i>Pediatric:</i> Clindamycin 10 mg/kg IV pre-op</p> <p><i>Adult:</i> Clindamycin 600 mg IV plus Gentamicin 1.5 mg/kg IV pre-op plus Q 8 h x 24 hr post-op</p> <p><i>Pediatric:</i> Clindamycin 10 mg/kg IV plus Gentamicin 2 mg/kg IV pre-op plus Q 8 h x 24 hr post-op</p>
<p><u>Vascular</u></p> <ul style="list-style-type: none"> <li>• Arterial surgery involving the abdominal aorta, a prosthesis or a groin incision</li> <li>• Carotid endarterectomy</li> <li>• Brachial artery repair with placement of prosthetic material</li> <li>• Lower extremity amputation</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Staphylococcus aureus</i></li> <li>• Coagulase-negative <i>Staph</i></li> <li>• Enterobacteriaceae</li> </ul>	<p><i>Adult:</i> Cefazolin 1 gm IV pre-op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg (max 1 gm) IV pre-op</p> <p><i>Adult:</i> Cefazolin 1 gm IV pre-op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg (max 1 gm) IV pre-op</p>	<p><i>Adult:</i> Vancomycin 1 gm IV pre-op</p> <p><i>Pediatric:</i> Vancomycin 20 mg/kg (max 1 gm) IV pre-op</p> <p><i>Adult:</i> Clindamycin 1 gm IV pre-op</p> <p><i>Pediatric:</i> Clindamycin 10 mg/kg IV pre-op</p>

SURGICAL PROCEDURE	COMMON PATHOGEN	RECOMMENDED REGIMEN	ALTERNATIVE REGIMEN
<p><u>Neurosurgery</u></p> <ul style="list-style-type: none"> <li>• Craniotomy</li> <li>• Skull fracture</li> <li>• CSF leak</li> <li>• Penetrating trauma</li> <li>• CSF shunt</li> <li>• Ventriculostomy placement</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Staphylococcus aureus</i></li> <li>• Coagulase-negative <i>Staph</i></li> </ul>	<p><i>Adult:</i> Cefazolin 1 gm IV pre-op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg (max 1 gm) IV pre-op</p>	<p><i>Adult:</i> Vancomycin 1 gm IV pre-op</p> <p><i>Pediatric:</i> Vancomycin 20 mg/kg (max 1 gm) IV pre-op</p>
<p><u>Spinal Surgery</u></p> <ul style="list-style-type: none"> <li>• Laminectomy</li>   <li>• Spinal fusion (insertion of foreign material)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Staphylococcus aureus</i></li> <li>• Coagulase-negative <i>Staph</i></li> </ul>	<p><i>Adult:</i> Cefazolin 1 gm IV pre-op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg (max 1 gm) IV pre-op</p> <p><i>Adult:</i> Cefazolin 1 gm IV pre-op plus Q 8 h x 2 doses post-op</p> <p><i>Pediatric:</i> 30 mg/kg IV (max 1 gm) pre-op plus Q 8 h x 2 doses post-op</p>	<p><i>Adult:</i> Vancomycin 1 gm IV pre-op x 1 dose</p> <p><i>Pediatric:</i> Vancomycin 20 mg/kg (max 1 gm) IV pre-op</p> <p><i>Adult:</i> Vancomycin 1 gm IV pre-op plus Q 12 h x 2 doses post-op</p> <p><i>Pediatric:</i> Vancomycin 20 mg/kg (max 1 gm) IV pre-op plus Q12 hx2 doses post-op</p>
<p><u>Orthopedic</u></p> <ul style="list-style-type: none"> <li>• Diagnostic or operative arthroscopy</li> <li>• Open reduction of fracture</li>   <li>• Fracture with internal fixation (nails, screws, plates)</li>   <li>• Total joint replacement</li>   <li>• Open fractures (considered contaminated)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Staphylococcus aureus</i></li> <li>• Coagulase-negative <i>Staph</i></li> </ul>	<p>Prophylaxis is not indicated</p> <p><i>Adult:</i> Cefazolin 1 gm IV pre-op (and Q 8 h x 24 hr post-op for hip fracture )</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg IV (max 1 gm) pre-op</p> <p><i>Adult:</i> Cefazolin 1 gm IV pre-op plus Q 8 h x 24 hr post-op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg IV (max 1 gm) IV pre-op plus Q 8 h x 24 hr post-op</p> <p><i>Adult:</i> Cefazolin 1 gm IV pre-op plus Q 8 h x 2 doses post-op</p> <p><i>Pediatric:</i> 30 mg/kg (max 1 gm) IV pre-op plus Q 8 h x 2 doses post-op</p> <p>Institute treatment rather than prophylaxis</p>	<p><i>Adult:</i> Vancomycin 1 gm IV pre-op plus Q 12 h x 24 hr post-op for hip fracture</p> <p><i>Pediatric:</i> Vancomycin 20 mg/kg IV (max 1 gm) pre-op</p> <p><i>Adult:</i> Vancomycin 1 gm IV pre-op plus Q 12 h x 2 doses post-op</p> <p><i>Pediatric:</i> Vancomycin 20 mg/kg (max 1 gm) IV pre-op plus Q 12 h x 2 doses post-op</p> <p><i>Adult:</i> Vancomycin 1 gm IV pre-op plus Q 12 h x 2 doses post-op</p> <p><i>Pediatric:</i> Vancomycin 20 mg/kg IV (max 1 gm) pre-op plus Q 12 h x 2 doses post-op</p>
<p><u>Head and Neck</u></p> <ul style="list-style-type: none"> <li>• Incision through oral, sinus, or pharyngeal mucosa</li> <li>• Tonsillectomy</li> <li>• Major neck dissection</li> <li>• Parotid surgery</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Staphylococcus aureus</i></li> <li>• <i>Streptococcus</i> spp.</li> <li>• Oral anaerobes</li> </ul>	<p><i>Adult:</i> Clindamycin 600 mg IV pre-op</p> <p><i>Pediatric:</i> Clindamycin 10 mg/kg IV pre-op</p>	<p><i>Adult:</i> Cefazolin 1 gm IV pre-op plus Metronidazole 500 mg IV pre-op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg IV (max 1 gm) plus Metronidazole 15 mg/kg IV pre-op</p>
<p><u>Gastrointestinal</u></p> <ul style="list-style-type: none"> <li>• Gastroduodenal procedures</li> <li>• Gastric resection</li> <li>• Gastroplasty</li> <li>• Esophageal (high risk only, obstruction, decreased gastric acidity or motility, morbid obesity, gastric ulcer or malignant hemorrhage)</li> <li>• Percutaneous endoscopic gastrostomy (PEG)</li> </ul>	<ul style="list-style-type: none"> <li>• Gram-positive cocci</li> <li>• Enterobacteriaceae</li> </ul>	<p><i>Adult:</i> Cefazolin 1 gm IV x 1 dose pre-op</p> <p><i>Pediatric:</i> 30 mg/kg (max 1 gm) IV pre-op</p>	<p><i>Adult:</i> Clindamycin in 600 mg IV pre-op plus Gentamicin 15 mg/kg IV pre-op</p> <p><i>Pediatric:</i> Clindamycin 10 mg/kg IV pre-op plus Gentamicin 2 mg/kg IV pre-op</p>

SURGICAL PROCEDURE	COMMON PATHOGEN	RECOMMENDED REGIMEN	ALTERNATIVE REGIMEN
<p><u>Gastrointestinal</u></p> <ul style="list-style-type: none"> <li>• Biliary tract (In high-risk patients &gt; 70 years of age)</li> <li>- common duct stone</li> <li>- obstructive jaundice</li> <li>- acute cholecystitis</li> <li>- non-functioning gallbladder</li> <li>- ERCP</li> <li>• Colorectal</li> <li>• Appendectomy (non- perforated)</li> <li>• Whipple procedure</li> <li>• Pancreatectomy</li> <li>• Small bowel</li> <li>• Perforated viscus</li> </ul>	<ul style="list-style-type: none"> <li>• Enterobacteriaceae</li> <li>• <i>Enterococcus</i> spp.</li> <li>• Clostridia</li> <li>• Enterobacteriaceae</li> <li>• Appendectomy</li> <li>• Enterococci</li> </ul>	<p>As above</p> <p><i>Adult:</i> Cefazolin 1 gm IV pre-op plus Metronidazole 500 mg IV pre-op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg IV (max 1 gm) pre-op plus Metronidazole 15 mg/kg IV pre-op</p> <p>Institute treatment rather than prophylaxis</p>	<p>As above</p> <p><i>Adult:</i> Clindamycin 600 mg IV pre-op plus Gentamicin 1.5 mg/kg IV pre-op</p> <p><i>Pediatric:</i> Clindamycin 10 mg/kg IV pre-op plus Gentamicin 2 mg/kg IV pre-op</p>
<p><u>Gynecologic Surgery</u></p> <ul style="list-style-type: none"> <li>• Vaginal, abdominal, laparoscopic hysterectomy</li> <li>• Cesarean section</li> <li>• Abortion</li> </ul>	<ul style="list-style-type: none"> <li>• Enterobacteriaceae</li> <li>• Group B streptococci</li> <li>• <i>Enterococcus</i> spp.</li> <li>• Anaerobes</li> </ul>	<p>Cefazolin 1 gm IV pre-op</p> <p>Cefazolin 1 gm IV x 1 dose after cord clamping</p> <p>Doxycycline 100 mg p.o. 1 hr pre-abortion and 200 mg p.o. ½ hr post-abortion</p>	<p>Clindamycin 600 mg IV pre-op plus Gentamicin 1.5 mg/kg IV pre-op</p> <p>Clindamycin 600 mg IV x 1 dose plus Gentamicin 1.5 mg/kg IV x 1 dose</p>
<p><u>Genitourinary</u></p> <ul style="list-style-type: none"> <li>• Cystoscopy alone (high risk)</li> <li>- Urine culture positive or unavailable</li> <li>- Pre-operative catheter insertion</li> <li>- Placement of prosthetic material</li> <li>• Cystoscopy with manipulated material</li> <li>• Cystoscopy with manipulation of upper tract</li> <li>• Transrectal prostate biopsy</li> <li>• Prostatectomy (TURP or peritoneal)</li> <li>• Lithotripsy</li> <li>• Nephrectomy</li> <li>• Adrenalectomy</li> <li>• Open or laparoscopic surgery</li> <li>• Ileal conduit</li> </ul>	<ul style="list-style-type: none"> <li>• Enterobacteriaceae</li> <li>• Enterococci</li> <li>• Enterobacteriaceae</li> <li>• Anaerobes</li> </ul>	<p><i>Adult:</i> Ciprofloxacin 500 mg PO 2 hr pre-op or Ciprofloxacin 400 mg IV 1-2 hr pre-op</p> <p><i>Pediatric:</i> Trimethoprim-Sulfamethoxazole (TMP-SMX) 6 mg/kg PO 2 h pre-op or Cefazolin 30 mg/kg (max 1 gm) IV pre-op</p> <p><i>Adult:</i> Cefazolin 1 gm IV pre-op <i>Pediatric:</i> Cefazolin 30 mg/kg IV (max 1 gm) pre-op</p> <p><i>Adult:</i> Cefazolin 1 gm IV pre-op plus Metronidazole 500 mg IV pre-op</p>	<p><i>Adult:</i> Clindamycin 600 mg IV pre-op plus Gentamicin 1.5 mg/kg IV pre-op</p>
<p><u>Plastic Surgery</u></p> <ul style="list-style-type: none"> <li>• Reconstructive surgery</li> <li>• Tissue flaps</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Staphylococcus aureus</i></li> <li>• <i>Streptococcus</i> spp.</li> </ul>	<p><i>Adult:</i> Cefazolin 1 gm IV pre-op <i>Pediatric:</i> Cefazolin 30 mg/kg (max 1 gm) IV pre-op</p>	<p><i>Adult:</i> Clindamycin 600 mg IV pre-op <i>Pediatric:</i> Clindamycin 10 mg/kg IV pre-op</p>
<p><u>Inguinal Hernia</u></p> <ul style="list-style-type: none"> <li>• Complicated, recurrent mesh placement</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Staphylococcus aureus</i></li> <li>• Coagulase-negative <i>Staph</i></li> <li>• <i>Streptococcus</i> spp.</li> </ul>	<p><i>Adult:</i> Cefazolin 1 gm IV pre-op <i>Pediatric:</i> Cefazolin 30 mg/kg (max 1 gm) IV pre-op</p>	<p><i>Adult:</i> Clindamycin 600 mg IV pre-op <i>Pediatric:</i> Clindamycin 10 mg/kg IV pre-op</p>

SURGICAL PROCEDURE	COMMON PATHOGEN	RECOMMENDED REGIMEN	ALTERNATIVE REGIMEN
<p><u>Breast</u></p> <ul style="list-style-type: none"> <li>Mastectomy involving placement of prosthetic material, saline implant, and/or tissue expander</li> </ul>	<ul style="list-style-type: none"> <li><i>Staphylococcus aureus</i></li> <li>Coagulase-negative <i>Staph</i></li> </ul>	<p><i>Adult:</i> Cefazolin 1 gm IV pre-op</p>	<p><i>Adult:</i> Clindamycin 600 mg IV pre-op</p>
<p><u>Interventional Radiology</u></p> <ul style="list-style-type: none"> <li>Biliary/GI procedure, including radio ablation or splenic embolization</li> <li>Urological procedure</li> <li>Implantable venous access port (e.g., mediport)</li> <li>Lymphangiogram, vascular malformation ablation, fibroid treatment</li> </ul>	<ul style="list-style-type: none"> <li><i>Staphylococcus aureus</i></li> <li>Coagulase-negative <i>Staph</i></li> <li>Gram-negative rods</li> </ul>	<p>Cefazolin 1 gm IV pre-op plus Metronidazole 500 mg IV pre-op</p> <p>Cefazolin 1 gm IV pre-op</p> <p>Cefazolin 1 gm IV pre-op</p> <p>Cefazolin 1 gm IV pre-op</p>	<p>Clindamycin 600 mg IV pre-op</p> <p>Gentamicin 1.5 gm IV pre-op</p> <p>Gentamicin 1.5 gm/kg IV pre-op</p> <p>Clindamycin 600 mg IV pre-op</p> <p>Clindamycin 600 mg IV pre-op</p>
<p><u>Ophthalmic</u></p>	<ul style="list-style-type: none"> <li><i>Staphylococcus aureus</i></li> <li>Coagulase-negative <i>Staph</i></li> <li>Streptococci</li> <li>Enterobacteriaceae</li> <li><i>Pseudomonas</i> spp.</li> </ul>	<p>Ophthalmic drops</p> <ul style="list-style-type: none"> <li>Gentamicin</li> <li>Tobramycin</li> <li>Polymyxin B gramcidin</li> <li>Ciprofloxacin (multiple drops topically over 2-24 hours)</li> </ul>	
<p><u>Renal Transplantation</u></p>	<ul style="list-style-type: none"> <li><i>Staphylococcus aureus</i></li> <li>Coagulase-negative <i>Staph</i></li> <li>Enterobacteriaceae</li> </ul>	<p><i>Adult:</i> Cefazolin 1 gm IV pre-op</p> <p><i>Pediatric:</i> Cefazolin 30 mg/kg (max 1 gm) IV pre-op</p>	<p><i>Adult:</i> Clindamycin 600 mg IV pre-op plus Ciprofloxacin 400 mg IV pre-op</p> <p><i>Pediatrics:</i> Clindamycin 10 mg/kg IV pre-op plus Gentamicin 2 mg/kg IV pre-op</p>
<p><u>Liver Transplantation</u></p>	<ul style="list-style-type: none"> <li>Enterobacteriaceae</li> <li><i>Enterococcus</i> spp.</li> <li>Staphylococci</li> </ul>	<p><i>Adult:</i> Piperacillin Tazobactam (Tazocin) 3.375 gm IV pre-op plus Q 6 h x 48 hr post-op</p> <p><i>Pediatric:</i> Tazocin 60 mg/kg IV pre-op plus Q 6 h x 48 hr post-op</p>	<p><i>Adult:</i> Vancomycin 1 gm IV pre-op plus Q 12 h post-op x 48 hr plus Ciprofloxacin 400 mg IV pre-op plus Q 12 h x 48 hr post-op</p> <p><i>Pediatric:</i> Vancomycin 20 mg/kg (max 1 gm) IV pre-op plus Q 12 h x 48 hr post-op plus Gentamicin 2 mg/kg IV pre-op plus Q 8 h x 48 hr post-op</p>

TITLE/DESCRIPTION:

**RESERVED**

INDEX NUMBER:

**ICM – VII-04**

EFFECTIVE DATE:

**01/01/2009  
01/01/2013**

APPLIES TO:

**All GCC Countries**

ISSUING AUTHORITY:

**GULF COOPERATION COUNCIL –  
CENTRE FOR INFECTION CONTROL  
(GCC-CIC)**

TITLE/DESCRIPTION: <b>IMMUNOCOMPROMISED PATIENT (Non-Hematopoietic Stem Cell Transplantation Patient)</b>		INDEX NUMBER: <b>ICM – VII-05</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidance on practices that minimizes the risk of exposure to infectious microorganisms in immunocompromised patients.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 15: Immunocompromised host. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Centers for Disease Control and Prevention (CDC). Guidelines for environmental infection control in healthcare facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). *MMWR* 2003;52(RR10);1-42
3. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007
4. Infection Prevention and Control Policy, [ICM-II-03 Standard Precautions](#)
5. Infection Prevention and Control Policy, [ICM-II-04 Hand Hygiene](#)

## COMMENTS

1. Patients who have congenital primary or secondary immune deficiency disorders are at increased risk for numerous types of infections while receiving healthcare and may be located throughout the hospital.
2. Immunocompromised patients can be cared for in the same environment as other patients. However, it is advisable to minimize exposure to other patients with transmissible infections such as influenza and other respiratory viruses.
3. A protective environment (including high-efficiency particulate air filtration of incoming air, 12 air exchanges, and positive pressure) is recommended for hematopoietic stem cell transplantation (HSCT) patients. Refer to policy [ICM-VII-06 Hematopoietic Stem Cell Transplantation \(HSCT\)](#)
4. Patients with a neutrophil absolute count of  $\leq 0.5$  can be placed in a protective environment until their neutrophil counts have recovered.

## PROCEDURE

Standard precautions including strict hand hygiene, aseptic technique, and barrier precautions (when necessary) must be used for patient care.

### A. Medical

1. Immunocompromised patients are at the highest risk of developing healthcare associated pneumonia.
2. Use of the Ventilator-Associated Pneumonia bundle is highly recommended to reduce this risk.

**B. Nursing**

1. Minimize the rotation of staff (such as those who float in and out of the unit/ward).
2. Staff should report any active infections to the supervisor and do not report to unit until assessment by the Employee Health Clinic regarding HCW exclusion or re-assignment is required.
3. When necessary, assess the patient daily for signs and symptoms of infection and initiate appropriate isolation techniques. Place the patient in a single room if the patient's condition indicates.
4. Avoid unnecessary direct contact with the patient, especially on the part of personnel not involved in essential care.

**C. Patient Care**

1. Immunocompromised patients can be cared for in the same environment as other patients. However, it is advisable to minimize exposure to other patients with transmissible infections such as influenza and other respiratory viruses.
2. Judicious use of antibiotics on these patients is recommended to prevent *C. difficile* infection.
3. Minimize traffic flow (visitors/personnel) in and out of the room.
4. Reduction of exposure to pathogens includes several practices:
5. Adhere strictly to Hand Hygiene practices with all patient care activities
6. Practice strict aseptic technique with all procedures.
7. Sinks, showers, dialysis water, ice and ice makers are all reservoirs for growing bacteria that can be the source of healthcare-associated infections (HAIs).
  - Bacteria such as *Pseudomonas*, *Legionella*, and non-tuberculosis mycobacteria are commonly encountered.
8. Fresh fruits and vegetables (which can carry several species of gram-negative bacilli) must not be ingested by severely immunocompromised patients.
  - a. These organisms can colonize the gastrointestinal tract of neutropenic patients after ingestion.
  - b. Neutropenic diet must consist entirely of cooked food.
  - c. All fruits and vegetables must be washed carefully.
  - d. Do not use food from outside sources.
9. Plants and fresh flowers carry microorganisms that are pathogenic (disease causing) for the immunocompromised patients.
10. Plants/flowers must be banned from high-risk areas such as oncology and burn units.
  - a. Handle plants/flowers with gloves and change water at least every 48 hours in designated sinks, not in patients' rooms.
    - i. Follow strict hand hygiene practices.
11. Do not allow visitors/sitters with communicable diseases. Children less than 12 years of age, unless they are children of the patient, should not be allowed in the wards.
12. Bathe the patient daily with mild soap to reduce the number of skin organisms.

**D. Visitors**

1. The healthcare team should ensure that visitors are properly screened for infections and instructed about the importance of proper infection control precautions, especially proper hand hygiene, in advance of contact with the patient.
  - a. All visitors should be instructed to follow the same standard precautions as healthcare workers.
  - b. Visitors who are currently suffering either from a diagnosed illness that is communicable by airborne, droplet nuclei, or contact routes or who have symptoms of upper respiratory infection or diarrhea should be banned from visiting the patient.
    - i. If visitation does take place, appropriate precautions should be employed.

**E. Toys in play areas**

1. Toys must be washable. Stuffed, fluffy toys are not recommended.
2. Clean and disinfect toys regularly and immediately when visibly soiled.

TITLE/DESCRIPTION: <b>HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)</b>		INDEX NUMBER: <b>ICM – VII-06</b>
EFFECTIVE DATE: <b>01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

This policy is intended to identify preventive measures and emphasize the provision of a protective environment and meticulous attention to infection control practices.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 42-C: Hematopoietic Stem Cell Transplantation. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Centers for Disease Control and Prevention (CDC). Guidelines for preventing opportunistic infections among Hematopoietic Stem Cell Transplantation (HSCT) recipients, *MMWR*, 2000.
3. Guidelines for preventing infectious complications among Hematopoietic Stem Cell Transplantation (HSCT) recipients: a global perspective. *American Society for Blood and Marrow Transplant*, 2009

## COMMENTS

1. HSCT recipients are at increased risk of infection for a variety of reasons, including neutropenia, mucositis, and the presence of indwelling catheters.
2. Key infection control measures include scrupulous attention to hand hygiene, care in the insertion and management of intravascular catheters and other medical devices, environmental cleaning, and screening and regulation of visitors and personnel.

## TERMINOLOGY

1. Bone marrow transplant: procedure in which *bone marrow* that is diseased or damaged is replaced with healthy bone marrow.
2. *Allogeneic*: Genetically dissimilar between donor and a recipient; genes are not identical in each organism.
3. *Autologous*: Derived from the same individual.
4. Graft versus host disease (GVHD): condition in which the donated cells recognize the recipients' cells as self. GVHD often involves the skin and gastrointestinal tract, resulting in a disruption of the barrier function of these organs and a corresponding increase in the risk of infection.

**NB:** HSCT recipients are considered immunocompromised for the first 24 months post-transplantation, when on immunosuppressive therapy, and/or if diagnosed with graft-versus-host disease.

## PROCEDURE

### A. Pre-transplant screening

As per protocols, to include a dental evaluation.

### B. Infection Prevention and Control Measures

1. Patients
  - a. Place HSCT patients in a single positive-pressure room.
  - b. Adhere to standard and transmission-based precautions. (Refer to policy [ICM-II-03 Standard Precautions](#) and [ICM-III-03](#) through [ICM-III-05 Contact, Droplet, Airborne Isolation Precautions](#).)
  - c. Bathe HSCT recipients daily using mild soap.
  - d. Maintain good oral and dental hygiene. HSCT recipients with mucositis should perform oral rinses 4 to 6 times per day.
    - i. A soft toothbrush should be used to clean teeth at least twice per day.
    - ii. A toothette stick can be used for patients who do not tolerate tooth brushing.
    - iii. The use of toothpaste is optional, but dental flossing should be performed if it can be done without trauma.
    - iv. During periods of mucositis, fixed appliances should not be worn.
    - v. Dentures may be worn during periods of mucositis, depending on the degree of tissue integrity and the ability of the patient to maintain oral hygiene.
    - vi. HCWs must always supervise oral hygiene.
  - e. Maintain good perineal hygiene. Females should wipe the perineum from anterior to posterior to prevent fecal contamination of the urethra (menstruating women should not use tampons).
  - f. Train patients regarding hand hygiene and observe their practices using antimicrobial soap or alcohol-based hand rubs.
  - g. Do not use rectal thermometers, enemas or suppositories.
  - h. Avoid performing rectal exams.
  - i. Inspect the potential sites of infection (perineum, catheter sites, etc.) daily during the period of neutropenia.
2. Precautions for HSCT patients while out of their room and during transfers
  - a. Place an N95 mask on the patient; if the N95 mask cannot be tolerated, use a surgical mask.
  - b. Place an N95 mask on the severely immunocompromised HSCT recipient when leaving rooms for diagnostics or procedures.
  - c. Place clean linen on the stretcher or wheelchair used for transfer.
  - d. Clean hands and follow precautions (use of gowns, gloves) when assisting the patient to a wheelchair or stretcher.
  - e. Remove gloves and wash hands after preparing the patient for transport.
  - f. Inform the receiving department that the patient requires special precautions.
  - g. Disinfect surfaces in the diagnostic areas with a hospital-approved disinfectant immediately before and after use.
3. Healthcare workers (HCWs)
  - a. Comply with hospital policy regarding pre-employment evaluation and required immunization for healthcare workers; evidence of this compliance should always be available.
  - b. Healthcare workers caring for HSCT patients should be immune to measles, mumps, rubella, varicella, and Hepatitis B; yearly influenza vaccination is mandatory.
  - c. HCWs should be aware of the potentially infectious conditions of the HSCT patients and prevention strategies.

- d. HCWs should be familiar with methods of screening visitors and family members before visiting the patients.
  - e. Adhere to proper hand hygiene practices at all times.
  - f. Healthcare workers with any suspected diseases should be restricted from patient contact until medically assessed and cleared.
    - i. Work restriction should be followed. HCWs are not to report for duty when they have flu-like symptoms but should report for medical assessment.
    - ii. Management of exposure: refer to policy [ICM –VI-09](#) *Management of selected airborne and droplet infectious disease exposures in healthcare workers*.
4. Room ventilation and engineering
- a. Place HSCT patients in a protective environment (PE) comprising positive room air pressure in relation to the corridor (pressure differential of >2.5 Pa [0.01' water gauge]) with:
    - i.  $\geq 12$  air exchanges per hour and high-efficiency (>99%) particulate air (HEPA) filters capable of removing particles  $\geq 0.3 \mu\text{m}$  in diameter.
  - b. Rooms should be well-sealed.
  - c. The air supply and exhaust grills should be located such that clean, filtered air enters from one side of the room, flows across the patient's bed, and exits on the opposite side of the room.
  - d. Self-closing doors should be placed at all room exits.
  - e. Maintain back-up ventilation equipment (e.g., portable units for fans or filters) for emergency provision of ventilation requirements for PE areas, and take immediate steps to restore non-functioning ventilation systems.
  - f. Use anterooms for patients who require both PE and Airborne Infection Isolation (All) to ensure proper air balance relationships and provide independent exhaust of contaminated air to the outside (or place a HEPA filter in the exhaust duct). If an anteroom is not available, place the patient in an All room and use portable ventilation units with industrial-grade HEPA filters to enhance filtration of spores.
  - g. Replace filters regularly based on the manufacturer's recommendations. When there is major construction in the facility, filtration efficiency should be monitored frequently to best determine the appropriate time for replacement.
5. Environmental cleaning
- Use a clean cloth for every few items in the room; do not put a dirty cloth back into the hospital-approved solution. All staff members are responsible for reporting any damage or issues that need prompt removal or fixing.
- a. Cleaning of an occupied patient room
    - i. Clean HSCT patients' rooms at least once per day with a hospital-approved disinfectant.
    - ii. Do not expose HSCT patients to activities such as vacuuming that could cause aerosolization of fungal spores.
    - iii. Bring carts to the entrance of the room. Leave them outside the door, close to the wall. Place a caution sign by the doorway. **DO NOT BLOCK ENTRANCES.**
    - iv. Clean hands and put on a pair of clean gloves and appropriate protective equipment (listed on the door).
    - v. Remove the garbage, wipe the inside and outside of the container, and line the container with a clean bag.
    - vi. Wipe the ceiling vents, curtain tracks, patient lift, light over the bed, doorframes, pictures/frames and monitors with a damp cloth and hospital-approved disinfectant.
    - vii. Clean carefully around patients and do not touch their belongings.
    - viii. Wipe the call bell and cord.
    - ix. Wash down the bed's headboard, footboard and rail thoroughly.

- x. Wipe all horizontal surfaces, windows, window sills, light switches and plates, telephones, televisions and door handles or knobs on both sides of the door.
  - xi. Wipe all furniture, the over-bed table, and the bedside table, including drawers.
  - xii. Spot wash the walls, windows, and wall attachments.
  - xiii. Cleaning a washroom/shower
    - Wipe the ceiling vents and the top of the light fixture. Wipe the mirrors, countertops, dispensers and sink. Refill dispensers if needed. Use a separate cloth to clean the toilet surfaces.
  - xiv. Cleaning the toilet must be carried out in a two-step process using only hospital-approved disinfectant:
    - Step 1: Wash down the toilet thoroughly using a damp cloth with hospital-approved disinfectant and leave it wet for five minutes.
    - Step 2: Wash down the toilet again using another clean, damp cloth with hospital-approved disinfectant and leave it wet for five minutes.
  - xv. Cleaning the floor
    - Damp mop the floor, starting at the end of the room and moving toward the door (including baseboards and corners).
    - Return all furniture to its original place in the room.
    - Remove caution signs only when the floor is completely dry.
    - Report any problems to your supervisor.
- b. Terminal cleaning after patient is discharged
- Nursing staff should ensure that room is free of used medical supplies and soiled patient care equipment, remove bed linen and ensure that the discharged or transferred patient has left the room before housekeeping performs terminal cleaning.
- i. Clean hands and put on a pair of clean gloves and appropriate protective equipment (listed on the door).
  - ii. Remove the garbage, wipe the inside and outside of the container, and line the container with a clean bag.
  - iii. Soak a cloth with hospital-approved disinfectant and thoroughly wash down the bed by wiping both sides of the mattress and the sides, wiping the entire bed frame and bars beneath the base of the frame and wiping the entire headboard and footboard.
  - iv. Wipe the call bell and cord.
  - v. Wipe the ceiling vents, curtain tracks, patient lift, light over the bed, doorframes, pictures/frames and monitors with a damp cloth and hospital-approved disinfectant.
  - vi. Wipe all horizontal surfaces, windows, window sills, light switches and plates, telephones, televisions and door handles or knobs on both sides of the door.
  - vii. Wipe all furniture, the over-bed table, and bedside table, including drawers.
  - viii. Spot wash the walls, windows, and wall attachments.
  - ix. Cleaning a washroom/shower: Wipe the ceiling vents and the top of the light fixture. Wipe the mirrors, countertops, dispensers and sink. Refill dispensers if needed. Use a separate cloth to clean the toilet surfaces.
  - x. Cleaning the toilet: Toilet cleaning must be carried out in a two-step process using only hospital-approved disinfectant:
    - Step 1: Wash down the toilet thoroughly using a damp cloth with hospital-approved disinfectant and leave it wet for five minutes.
    - Step 2: Wash down the toilet again using another clean damp cloth with hospital-approved disinfectant and leave wet for five minutes.
  - xi. Cleaning the floor
    - Damp mop the floor, starting at the end of the room and moving toward the door (including baseboards and corners).
    - Return all furniture to its original place in the room.
    - Remove caution signs only when the floor is completely dry.

- xii. Report any problems to your supervisor.
  - c. After the cleaning process, nurses will make the bed with clean linen and leave clean linen supplies (bath towel, face cloth, patient gown) in the room.
  - d. If a room was used for a patient in contact isolation, curtains should be removed before room is cleaned and replaced with clean ones after the room has been cleaned.
6. Equipment
- a. Follow hospital procedures for equipment cleaning and disinfection.
  - b. Monitor opened and unopened wound-dressing supplies such as adhesive bandages and surgical and elastic adhesive tape to detect mold contamination; discard them if they are out of date or have damaged packaging.
7. Plants, play areas, and toys
- a. Do not allow live plants and dried or fresh flowers in the rooms of HSCT patients.
  - b. Disinfect play areas for pediatric HSCT patients at least weekly and as needed.
  - c. Allow only toys and games that can be cleaned and disinfected.
  - d. Clean and disinfect toys and games at least weekly and as needed.
  - e. Do not allow infants, toddlers or children who put toys in their mouths to share toys.
  - f. Offer disposable play items when possible.
  - g. Discard toys that cannot be cleaned and disinfected after use.
  - h. Clean and disinfect occupational and physical therapy items as per guidelines.
8. Visitors
- a. Screen all visitors for potentially infectious conditions.
  - b. Do not allow visitors with potentially communicable diseases to have contact with HSCT patients.
  - c. Allow only visitors who have the capacity to understand and follow hand hygiene and isolation procedures.
  - d. Restrict the number of visitors at any one time to a number that allows for appropriate screening and education.
9. Infection Prevention surveillance
- a. Do not perform routine fungal or bacterial cultures of asymptomatic HSCT recipients.
  - b. Do not perform routine surveillance environmental cultures or fungal cultures of devices in the absence of epidemiologic clusters of infection.
  - c. Perform routine sampling of air, ventilation ducts, and filters on a monthly basis for the first 18 months following the start of HSCT service and then as needed, if clinical surveillance indicates an increase in infections due to mold.
10. Prevention of intravascular catheter infection
- a. Follow aseptic technique (refer to policy [ICM-II-05 Aseptic Technique](#)).
  - b. Contact between tap water and the central venous catheter site should be avoided.
  - c. Completely implanted central venous catheters can be used in children younger than 4 years of age.
  - d. HSCT recipients and HCWs should receive education regarding proper care of intravenous devices.
  - e. HCWs should receive training regarding Central Line Bundles.
11. Construction and renovation
- a. Enforce the infection prevention and control procedure for hospital and healthcare facility construction/renovation.
  - b. Notify Infection Prevention and Control department of any planned construction and renovation.

TITLE/DESCRIPTION: <b>PREVENTION OF TRANSMISSION OF INFECTION AMONG CHRONIC DIALYSIS PATIENTS</b>		INDEX NUMBER: <b>ICM – VII-07</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide the guidelines needed for the prevention of infection transmission among chronic dialysis patients. These guidelines include recommendations for the management of equipment, water supply, screening, monitoring of patients and HCWs and other related activities.

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## COMMENTS

1. Hemodialysis was introduced first in 1940, and until the early 1960s, it was used exclusively for the treatment of acute renal failure. Subsequently, with the development of advanced technology in dialysis equipment, the use of both hemodialysis and peritoneal dialysis has increased. Dialysis is a hazardous process, and adverse reactions may occur due to chemical or microbial contamination during the process of dialysis.
2. Patients with end-stage renal failure necessitating the use of dialysis are more susceptible to infections due to their immune system dysfunction and the use of artificial organs made of foreign material. The renal condition of many of these patients is the consequence of an original disease that affects the immune system (e.g., diabetes mellitus and systemic lupus erythematosus).

## TERMS

1. Dialysis is a process that replaces the normal function of the kidney by removing toxins and excess fluids from the bloodstream. There are two types of dialysis: hemodialysis and peritoneal dialysis.
2. Hemodialysis (HD) is a process that involves circulating the patient's blood outside of the body through an extracorporeal circuit (ECC), where it is separated from dialysis fluid by an artificial semi-permeable membrane.
3. Peritoneal dialysis, uses the patient's peritoneum, or the lining of the abdomen, to dialyze waste products from the patient's blood.

## PROCEDURE

### A. Infectious complications

#### 1. Dialysis

In general, the hemodialysis system consists of a water supply, a system for mixing water and concentrated dialysis fluid and a machine to pump the dialysis fluid through the artificial kidney. This aqueous environment provides a good growth medium that can result in the massive accumulation of Gram-negative bacteria, which can have direct and indirect infectious complications for patients such as septicemia and a pyrogenic reaction to bacterial endotoxins.

- a. Non-tuberculous mycobacteria, which have the capability of multiplying in aqueous environments, can cause some infectious complications for dialysis patients.
- b. The process of hemodialysis requires vascular access for prolonged periods; hence, these patients are at high risk for vascular access infection.
- c. Such an infection is usually caused by *S. aureus*, coagulase-negative staphylococci, Gram-negative bacilli, non-staphylococcal gram-positive cocci (including enterococci), or fungi.
- d. Bacterial infections, especially those involving vascular access, are considered the most frequent infectious complications of hemodialysis and the most common cause of morbidity and mortality among patients undergoing hemodialysis.

#### 2. Peritoneal dialysis (PD)

PD is associated with several infection risks and complications involving the catheter exit site (exit site infection), infection of the subcutaneous catheter (tunnel infection), and peritonitis. Peritonitis is considered the most serious complication and leads to the destruction of the peritoneal membrane and a shift to hemodialysis treatment. Studies have suggested that PD patients who use automated cycles are less prone to infections.

The most commonly diagnosed pathogens involved with peritoneal dialysis infections are:

- a. Gram-positive bacteria as a group (including *S. epidermidis* and *S. aureus*) are the most common etiologic agents causing peritonitis, complicating conventional PD. Patients who are nasal carriers of *S. aureus* are at a high risk for exit site infection and peritonitis.
- b. Gram-negative bacteria: These are found on the skin and in the gastrointestinal tract, the urinary tract, contaminated water, and disinfectant solutions. Automated peritoneal dialysis machines can serve as a reservoir for pathogens (e.g., *Pseudomonas* spp. and non-tuberculous mycobacteria).

- c. Fungi: The fungal infections are usually difficult to eradicate and require early removal of the catheter. One of the predisposing factors for fungal infection is prior use of antibiotic therapy.

## B. Water supply

Dialysis centers use water from the public supply, which despite being chlorinated, is usually contaminated with bacteria (e.g., Gram-negative bacteria, non-tuberculous mycobacteria and certain types of blue-green algae). Endotoxins produced by Gram-negative bacteria may reach levels high enough to produce a pyrogenic reaction in patients undergoing dialysis.

### 1. Water treatment system

Water used for the production of dialysis fluid must be treated adequately by reverse osmosis (RO) to remove chemical contaminants. It should be also filtered to prevent bacterial contamination. Used filters should be frequently and regularly changed and/or disinfected according to the manufacturer's instructions.

### 2. Distribution system

- a. This system delivers dialysis fluids to each dialysis machine and consists of plastic pipes and appurtenances. This distribution system plays a role in microbial contamination because pipes that are larger diameter and longer than necessary are frequently used to control the required fluid flow. This scenario increases both the total volume and the wetted surface area of the system and decreases the fluid velocity, which allows Gram-negative bacteria to multiply rapidly and colonize the wetted surfaces of the pipes. Such colonization leads to the formation of biofilms, which are usually difficult to remove or disinfect.

- b. To ensure adequate disinfection of the distribution system, the system should be routinely disinfected at least weekly. Furthermore, the system should be designed in a way that facilitates adequate disinfection and prevents fluids from being trapped and serving as a reservoir for bacteria. Use of an ultra-filter at the outlet of the storage tank of the distribution system is recommended.

### 3. Regular monitoring of the system

Standard microbial assay methods to test for waterborne microorganisms should be performed at least monthly and after disinfection of the system or after maintenance work.

Tests should be repeated if counts are elevated [i.e., more than 200 colony forming units per milliliter (CFU/ml)]. There should be written procedures regarding water monitoring and a plan of action if excessive contamination is found.

## C. Disinfection of the dialysis system:

1. The purpose of the disinfection procedures for the dialysis system is not only to prevent the multiplication of waterborne bacteria to a significant level but also to eliminate bloodborne viruses.
2. The routine disinfection of isolated components of a dialysis system is usually inadequate, and consequently, the complete dialysis system (water treatment system, distribution system and dialysis machine) should be considered during the disinfection procedures. For single-pass machines, the disinfection process should be performed at the beginning and end of the shift. Disinfection processes should be performed after each use for batch recirculating machines.
3. The rinse water, which usually contains some Gram-negative bacteria, should not be permitted to stand overnight; otherwise, the water will contain significant microbial

contamination and nullify the disinfection procedure. Different types of disinfectants are used for the purpose of disinfecting dialysis systems. The manufacturer's instructions should be followed for both the machines and the disinfectants.

#### **D. Dialysis facility**

1. At least one separate room for dialyzing patients with positive HBsAg.
2. Adequate storage rooms for clean and sterile supplies.
3. A designated room for disinfection of portable dialysis equipment.
4. A dirty (soiled) utility room with a sluice for disposal of blood or body fluid.
5. Handwashing sinks must be close to the nurse station and patient treatment areas. One handwashing sink for every four (4) dialysis chairs.
6. Alcohol hand rub in a wall-mounted dispenser or tabletop pump bottles should be available for hand hygiene.

#### **E. Record keeping**

1. A properly kept recording system is essential in the dialysis unit for better surveillance and follow-up purposes.
  - a. The patient records in the dialysis unit should include the following:
    - i. Lot number of all blood and blood products used.
    - ii. Name or number and location of the machine used for each dialysis session.
    - iii. Names of staff members assigned for the patient during each dialysis session.
    - iv. Any mishaps, including dialysis machine malfunction and blood leaks.
  - b. A log for all incidents sustained by patients and staff, such as needlestick injury.
  - c. A log for all hepatitis serology results for patients.

#### **F. Housekeeping**

1. Dialysis units are considered high-risk areas due to the nature of the procedures performed and the immune status of the patients; thus, housekeeping should serve two tasks: removal of soil and waste to prevent the accumulation of infectious material and maintaining a clean environment for better patient care.
  - a. Special training should be given to housekeeping personnel working in the dialysis unit.
  - b. The patient care area should be utilized efficiently by arranging the required items, discarding the unneeded ones and removing excess tubes and wires on the floor.
  - c. All personnel should wear gloves and gowns during work and when handling contaminated items.
  - d. Chairs and beds should be cleaned and disinfected with hospital-approved disinfectants between patients.
  - e. Separate cleaning tools should be used for cleaning the area designated for patients with bloodborne diseases.
  - f. Linens should be used on chairs and beds and should be changed after each patient.
  - g. Chairs and beds should be cleaned with hospital-approved disinfectant after each use.
  - h. Soiled linens and other laundry items should be placed in water-soluble bags before sending to the laundry.
  - i. Or soiled linen should be collected in such a way as to keep the heavily soiled portion contained in the center by folding or rolling the soiled part.

**G. Waste management:**

1. Disposable items should be placed in strong leak-proof bags; double bagging is only necessary when contamination of the outer surface occurs.
2. Disposable used needles and sharp items should be discarded in hospital-approved puncture-proof sharps containers.
3. All used disposable items should be discarded according to the waste management policy.

**H. Infection control practices in the dialysis unit:**

Infection control recommendations for the prevention of hospital-acquired infections in hemodialysis patients:

1. Use Standard Precautions for all patients, regardless of their known or presumed infectious status (Refer to policy [ICM II-03 Standard Precautions](#))
2. Hand Hygiene (Refer to policy [ICM II – 04 Hand Hygiene](#))
  - a. Before and after handling dialysis machine
  - b. Before and after performing non-invasive techniques
  - c. Before performing any invasive procedure such as inserting a circulatory access, CV lines and peritoneal catheters
  - d. Before and after connecting the patient to the dialysis machine through the AV fistula
  - e. Before donning gloves and after removal of gloves
  - f. After leaving a particular patient's dialysis station and before dealing with another patient's station
3. Gloves
  - a. Use non-sterile disposable gloves when performing non-invasive procedures or when cleaning or disinfecting instruments or the environment, including the dialysis machine.
  - b. Use sterile gloves when performing invasive procedures or connecting the patient to the dialysis machine.
4. Personal protective equipment (PPE)
  - a. Personnel should always wear protective equipment (fluid-resistant gown, mask, and eyewear) to prevent exposure to blood in the event that there is rupture of the hemodialyzer membrane and/or a disconnection or rupture of tubing.
  - b. Water-proof aprons or gowns should be worn if the nurse is located within the patient station providing any service.
  - c. It is advisable for staff to wear protective eyeglasses and surgical masks during procedures in which splashing of blood is anticipated.
  - d. Staff should change gowns between patients, and the gowns should be discarded at the end of the day.
  - e. Staff should not drink, eat or smoke in the dialysis treatment area.
  - f. Crowding of patients and staff should be avoided; give enough space for the easy movement of staff, placement of equipment and cleaning of the environment.

**I. Bloodborne viral infections**

In the dialysis unit, both patients and staff are at high risk of acquiring bloodborne viral infections. Viral hepatitis is a major complication of hemodialysis, and several agents such as Hepatitis B, C, and D are involved.

Recent studies have proven that HIV is significantly less efficiently transmitted than Hepatitis B virus.

1. Hepatitis B (HBV) infection
  - a. Mode of Transmission of Hepatitis B
    - i. Chronically infected patients are the primary source of transmission. HBV is considered to be a resistant virus, is relatively stable in the environment, and remains viable for at least seven days on environmental surfaces at room temperature.
  - b. Dialysis staff members may acquire the infection by
    - i. Accidental needle puncture through intact skin.
    - ii. Infected plasma, serum or contaminated environmental surfaces through breaks in the skin such as abrasions, cuts, or scratches.
    - iii. Introduction of infected serum or plasma into mucosal membranes (e.g., the splashing of blood onto the mouth or eyes).
  - c. Dialysis patients may become infected through the following means
    - i. Internally through contaminated dialysis equipment (e.g., venous pressure gauges, isolators or filters).
    - ii. Externally through contaminated dialysis machines, including their surfaces, control knobs or intravenous poles.
    - iii. Improperly prepped or contaminated injection site.
    - iv. Through breaks in the skin or mucous membranes.
    - v. Contaminated items and surfaces such as clamps, scissors, telephones or walls.
    - vi. Improper handling of multiple-dose medication vials and intravenous solutions.
    - vii. The dialysis staff (contaminated hands, gloves and other objects).
  - d. Screening
 

All patients in the dialysis unit should be screened for hepatitis B surface antigen (HBsAg) and anti-HBs, HBc and HCV Ab when they join the unit, to determine their serologic status, and then tested periodically according to the following table.

Patient Status	On Admission*	Monthly	Semi-annual	Annual
All patients	HBsAg, anti-HBc(total), anti-HBs, anti-HCV, ALT			
HBV susceptible, including nonresponders to vaccine		HBsAg		
Anti-HBs positive (> 10 mIU/mL), anti-HBc negative				Anti-HBs
Anti-HBs and anti-HBc positive		No additional HBV testing needed		
Anti-HCV negative		ALT	Anti-HCV	

\*Results for HBV testing should be known before the patient begins dialysis.  
 HBsAg, Hepatitis B surface antigen; anti-HBc, antibody to hepatitis B core antigen; anti-HBs, antibody to hepatitis B surface antigen; anti-HCV, antibody to hepatitis C virus; ALT, alanine aminotransferase.

- e. Hepatitis B Vaccination
  - i. Hepatitis B vaccination is recommended for all susceptible patients and staff in the hemodialysis unit.
  - ii. Vaccination includes three IM doses, with the second and the third doses given at one and six months, respectively. Test for anti-HBs 1 to 2 months after the last dose.

- iii. If anti-HBs levels are below 10 mIU/ml, revaccinate with 3 additional doses.
  - iv. Patients who are anti-HBc and HBsAb+ do not require further testing.
  - v. Patients who are only positive for HBsAb require annual anti-HBs testing and a booster if anti-HBsAb levels decline to less than 10 mIU/ml (APIC Chapter 48, p. 14).
- f. Management of Hepatitis B virus-positive patients
- i. Isolate HBsAg-positive patients in a designated or separate room for treatment with dedicated machines, equipment, instruments, supplies, and medications. These equipment and supplies must not be used on HBV-susceptible patients.
  - ii. These patients should be dialyzed at a station away from adjacent stations (e.g., at the end or corner of the unit).
  - iii. HCWs caring for HBsAg-positive patients should not care for susceptible patients at the same time, including during the period when dialysis is terminated for one patient and initiated for another.
  - iv. HCWs should not attend to both HBsAg-positive and HBV-susceptible patients during the same shift.
  - v. Machines used on an HBsAg-positive patient must be disinfected using manufacturer's recommendations and should not be included in the dialyzer reuse program.
  - vi. External surfaces should be cleaned using hospital-approved disinfectant.
  - vii. A specific dialysis machine, bed, chair, and supply tray (including tourniquet, antiseptics and blood pressure cuff) should be assigned for each patient.
  - viii. Disposable, single-use external venous and external pressure transducer filters/protectors should be used once for each patient and discarded. These items should not be reprocessed or reused.
  - ix. Non-disposable items such as clamps and scissors should be appropriately cleaned and disinfected or sterilized before use with another patient.
  - x. When multiple-dose medication vials are used, doses should be prepared and labeled in a clean area away from the dialysis stations and should be delivered separately to each patient.
  - xi. Do not use common medication carts to deliver medications to patients. Trays should be used to deliver medications to individual patients. These trays must be cleaned and disinfected between patients.
  - xii. Patients should not share food or utensils with other patients or staff.
  - xiii. HCWs should change PPE and perform hand hygiene between patients.
- g. HBsAg seroconversion
- i. Report HBsAg-positive seroconversion to the local health department as required by law or regulation.
  - ii. When a seroconversion occurs, review all patients' routine laboratory test results to identify additional cases.
  - iii. Investigate potential sources for infection to determine whether transmission may have occurred within the dialysis unit. Review newly infected patients' recent medical history (e.g., blood transfusion, hospitalization) and history of high-risk behavior (e.g., hypodermic drug use, sexual activity) as well as the unit practices and procedures.
  - iv. In patients newly infected with HBV, HBsAg is often the only serologic marker detected; repeat HBsAg testing and test for anti-HBc (including anti-HBc IgM) 1

to 2 months later. Six months later, repeat HBsAg testing and test for anti-HBs to determine clinical outcome and the need for counseling, medical evaluation, and vaccination of the patient's contacts.

- v. Patients who become HBsAg-negative are no longer infectious and can be removed from isolation.

## 2. HCV Infections

### a. Mode of transmission

HCV is most efficiently transmitted by percutaneous exposure to infectious blood. A chronically infected person is central to transmission, which occurs because of inadequate infection control practices and cross-contamination among patients.

### b. Screening

- i. Screening of patients for HCV should be performed upon admission to determine the prevalence of the virus in the hemodialysis unit.
- ii. Screening for ALT and anti-HCV should be carried out upon admission, with anti-HCV-negative patients screened monthly for ALT and semi-annually for anti-HCV.

### c. Management of HCV infection

- i. HCV transmission within the dialysis environment can be prevented by strict adherence to the infection control precautions recommended for all hemodialysis patients.
- ii. Although the isolation of HCV-infected patients is not recommended, routine testing for ALT and anti-HCV is important for monitoring transmission within centers and ensuring that appropriate precautions are being properly and consistently used.
- iii. HCV-positive persons should be evaluated (by consultation or referral, if appropriate) for the presence or development of chronic liver disease according to current medical practice guidelines.
- iv. HCV-positive patients should receive information concerning how they can prevent further harm to their liver and prevent transmitting HCV to others.
- v. Persons with chronic liver disease should be vaccinated against hepatitis A, if susceptible.

### d. HCV-negative patients

- i. Monthly ALT testing will facilitate the timely detection of new infections and provide a pattern from which to determine when exposure or infection may have occurred.
- ii. In the absence of unexplained ALT elevation, testing for anti-HCV every 6 months should be sufficient to monitor the occurrence of new HCV infections.
- iii. If unexplained ALT elevation is observed in patients who are anti-HCV negative, repeated anti-HCV testing is warranted. If unexplained ALT elevation persists in patients who repeatedly test anti-HCV negative, testing for HCV RNA should be considered.

### e. Anti-HCV seroconversion

- i. Report anti-HCV-positive seroconversion to the local health department as required by law or regulation.
- ii. When a seroconversion occurs, review all other patients' routine laboratory test results to identify additional cases.
- iii. Perform additional testing as indicated later in this section.
- iv. Investigate potential sources for infection to determine if transmission may have occurred within the dialysis unit; review newly infected patients' recent medical history (e.g., blood transfusion, hospitalization) and history of high-risk behavior (e.g., hypodermic drug use, sexual activity) as well as unit practices and procedures.

- v. If patient(s) seroconvert from anti-HCV-negative to anti-HCV-positive during a 6-month period, frequent monitoring (every 1 to 3 months) of all patients may be indicated for a limited time to detect additional infections. If no additional cases are identified, semi-annual testing can be resumed (APIC Chapter 48, p 15).
3. Hepatitis D infections
    - a. Delta Hepatitis is caused by hepatitis delta virus (HDV), which causes infection only along with active HBV infections either as a co-infection or superinfection.
    - b. Screening
      - i. Routine testing of hemodialysis patients is not recommended.
      - ii. Prevention of HBV transmission will reduce the risk of HDV infection in HBV-susceptible patients.
    - c. Management of HDV infection
      - i. Patients known to be infected with HDV should be isolated from all other dialysis patients, including HBV-positive patients, and should receive dialysis on dedicated machines (APIC Chapter 48, p 14).
      - ii. Routine screening for HDV is only indicated if there is a patient who is known to be infected with HDV or evidence of transmission within the dialysis unit.
  4. HIV infections
    - a. Mode of transmission
      - i. HIV is transmitted by blood and body fluids.
    - b. Screening
      - i. Routine testing for HIVAb for the purpose of infection control is not recommended.
      - ii. HIV patients do not require isolation from other patients or separate dialysis on dedicated machines.
    - c. Management of HIV infection
      - i. Patients with risk factors for HIV infection should be tested so that if they are infected, they can receive proper medical care and counseling regarding preventing the transmission of the virus.
      - ii. Infection control practices such as standard precautions and hand hygiene are sufficient to prevent HIV transmission between patients.
      - iii. Patients with risk factors should be tested. If found to be positive, they should receive counseling and medical care.

#### **J. Vaccination against *Pneumococcus*, influenza, and HAV**

1. The pneumococcal polysaccharide vaccine is indicated in chronic renal failure patients. A second dose of the vaccine should be administered 5 or more years after the first dose.
2. A yearly influenza vaccination is recommended to prevent influenza and its associated severe complications.
3. There are no specific recommendations for HAV vaccination for hemodialysis patients. The inactivated killed vaccine is recommended for persons with chronic liver disease (HCV and HBV infection), given in 2 doses 6 months apart.

#### **K. Prevention and management of bacterial infections**

1. Follow published guidelines for the judicious use of antimicrobials, particularly vancomycin, to reduce selection for antimicrobial-resistant pathogens.
2. Infection control practices such as standard precautions and hand hygiene are sufficient to prevent disease transmission for patients infected or colonized with pathogenic bacteria, including antimicrobial-resistant strains.
3. A single isolation room is recommended for patients who may be at increased risk for transmitting pathogenic bacteria. Such patients include those with either

- a. An infected skin wound with drainage that is not contained by dressings (the drainage does not have to be culture positive for VRE, MRSA, or any specific pathogen) or
- b. Fecal incontinence or diarrhea not successfully controlled with personal hygiene measures.
- c. For these patients, consider using the following additional precautions:
  - i. staff members treating the patient should wear a separate gown over their usual clothing and remove the gown when finished caring for the patient
  - ii. dialyze the patient at a station with as few adjacent stations as possible (e.g., at the end or corner of the unit).
- d. If a private room is not possible, separation of patients and staff, strict adherence to standard precautions and meticulous environmental cleanliness is recommended.
- e. Comply with standard and isolation precautions for patients with any antimicrobial-resistant pathogen.

#### **L. Hemodialysis staff members**

1. Routine testing of staff members is not recommended for HBV except when required to document response to HBV vaccination.
2. In addition, routine testing of staff for HCV, HDV, or HIV is not recommended.

#### **M. Patient monitoring**

The patient's temperature should be monitored before and after dialysis to detect early signs of a pyrogenic reaction. Any fever ( $> 37.8^{\circ}\text{C}$ ) or rigors should be investigated by:

- a. Clinical assessment of the patient to rule out other causes of fever (e.g., pneumonia).
- b. Culturing of blood samples.
- c. Culturing of other body fluids or secretions if suspected to be the source of infection.
- d. Culturing of the dialysate (on the downstream side) using quantitative and qualitative bacteriologic assays.

#### **N. Education**

1. A continuous educational program regarding infection control should be instituted in dialysis units for patients and staff. The program should highlight the following points:
2. Nursing Education
  - a. The most common pathogens causing infections in dialysis patients.
  - b. Principles and practices of infection control (aseptic technique, hand hygiene and standard precautions) to prevent the transmission of microorganisms both in the dialysis unit and at home.
3. Patient Education
  - a. Patients should be instructed to keep the access site clean and dry at all times. The importance of personal hygiene and its possible relation to access site infections should be emphasized.
  - b. Patients should be instructed about the proper way to care for the access site and to recognize and report any signs and symptoms of infection immediately. These signs include fever, chills, pain, and redness or drainage around the access site.

#### **O. Infection control recommendations for peritoneal dialysis at home**

1. Continuous ambulatory peritoneal dialysis (CAPD), continuous cyclic peritoneal dialysis (CCPD), and nocturnal intermittent peritoneal dialysis (NIPD) all are self-administered treatment done at home. Care to prevent infection during the process of dialysis is of high importance.

2. When replacing the solution or removing it, this process should be done under the following precautions:
  - a. The room should not be crowded; no more than two attendants should be in the room.
  - b. The room should be clean.
  - c. The bed sheets should be clean.
  - d. The patient should be kept away from air drafts.
  - e. The patient should be hygienically clean and wearing clean clothes.
  - f. The care provider should:
    - i. Not be complaining of fever, upper respiratory tract infection, skin infection, eye discharge or diarrhea.
    - ii. Wear clean clothes.
    - iii. Cut nails short.
    - iv. Wash hands thoroughly with soap and water and then dry hands using a clean towel.
    - v. Avoid touching surfaces and items not related to the procedures to avoid contamination of his/her hands.
  - g. During the process, smoking and unnecessarily talking are not permitted.
  - h. Sterile supplies (e.g., clamps, gauze) should be used.
  - i. The site of the peritoneal catheter should be cleaned using a proper antiseptic solution.
  - j. Used disposable items should be discarded directly in a separate yellow bag, and the area should be kept clean.
  - k. Finally, the hands of the care providers and the helpers should be washed using soap and water.
  - l. The treating physician should be informed about any complaint, for example, redness at the site of infection, fever, or change in the color of the fluid drained.
  - m. Continuous care of the site of insertion between dialysis sessions should be as follows:
    - i. The site should be kept covered using sterile gauze.
    - ii. When taking a bath, the site should be covered using a plastic bag to avoid wetting of the gauze and to prevent water from entering through the catheter into the peritoneal cavity.
  - n. Vaccination against Hepatitis B is preferable for both the patient and the care provider.

## Section 8: DEPARTMENTAL POLICIES & PROCEDURES

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TITLE/DESCRIPTION: <b>NUTRITION SERVICES</b>		INDEX NUMBER: <b>ICM – VIII-01</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide food services staff with infection control and environmental health guidelines and standards to prevent food borne diseases and food poisoning.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 58: Nutritional services. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Environmental Health Manual, Infection Prevention and Control Department, KAMC.

## PROCEDURE

### A. Food service manager

1. Provides written standards for:
  - a. Safe preparation, handling and storage of food to minimize contamination by microorganisms and chemicals.
  - b. Cleaning and sanitizing of trays, utensils, tableware and other surfaces.
  - c. Employee health and work restrictions.
  - d. Employee orientation, education, and training.
  - e. Valid health certificates issued by the Infection Prevention & Control Department.
2. Conducts educational programs for personnel concerning food preparation and storage and personal hygiene and their relevance to food borne infections. The educational sessions should include and not be limited to the following:
  - a. Hand hygiene.
  - b. Bacterial growth and temperature.
  - c. Food storage, preparation, transportation and display.
  - d. Sanitation and disinfection.
  - e. Personal hygiene.
3. Assures that food handlers are monitored appropriately for illnesses.
4. Restricts unauthorized personnel from entering food preparation areas and food facilities in general.
5. Restricts visitor entry unless the visitor is wearing a over coat and hair cover.
6. Assures that food handlers carry out all cleaning procedures in a manner consistent with optimal food hygiene.

### B. Food handlers

1. In addition to the hospital pre-employment screening requirements, food handlers complete a screening process involving the following:
  - a. Clinical examination (evaluation of the chest and abdomen as well as possible skin diseases and other communicable diseases).
  - b. Chest X-ray to rule out pulmonary tuberculosis.
  - c. Stool analysis for ova and parasites.
  - d. Stool culture for *Salmonella*, *Shigella* and *Vibrio cholerae*.

- e. Vaccination for meningococcal disease, with a booster every 5 years.
- f. Vaccination for typhoid fever, with a booster every 5 years.
2. Receive a valid medical examination certificate indicating that they are free from infectious diseases and fit to work as a food handler; this certificate must be issued by the Infection Prevention & Control Department and will be valid for one year, renewable yearly after an assessment of the food handler.
3. Repeat clinical examination every six months and when employee leaves on vacation to areas at high risk for communicable diseases.
4. Follow proper and frequent hand hygiene and personal hygiene practices
  1. Fingernails: Keep fingernails trimmed and filed; do not apply finger nail polish or artificial fingernails.
  2. Jewelry: Do not wear jewelry on the arms and hands while preparing food to allow for proper hand hygiene.
5. Wear and maintain proper clean attire during food handling (clean uniform, apron, hair and beard restraint, clean gloves when needed). Do not wear street clothes in food service areas.
6. Do not eat, drink or smoke while preparing or handling food.
7. Do not go to the washroom with masks or gloves on.

### C. Purchasing and receiving

1. Purchase food from a reputable source and inspect upon delivery for the expiration date and signs of spoilage. Reject damaged food or containers.
2. Select food products in commercially filled, unopened packages whenever possible.
3. Store perishable foods immediately at the proper temperature.
4. Dispose of damaged items.

### D. Storage

1. Store non-perishable food in clean, dry, properly ventilated areas and inspect them periodically for expiration dates and any signs of spoilage.
2. Store food in designated areas. Do not store in housekeeping and dishwashing areas or near any sources of potential contamination.
3. Store food at least 8 to 10 inches above the floor level and away from walls to facilitate cleaning and allow for pest control measures.
4. Rotate food stocks to avoid using expired food.
5. Store food products in a way that avoids cross-contamination between cooked and raw foods and between washed and non-washed food.
6. Store food covered and labeled at the proper temperature (freezing storage, less than -18°C; refrigeration, 2-7°C; hot storage, above 60°C).
7. Monitor the temperature of all refrigerators and freezers and record them daily in a log.
8. Maintain good housekeeping and hygienic conditions.

### E. Preparation

1. Instruct personnel and supervise them regarding personal hygiene and food safety during food preparation.
2. Wash vegetables and fruits properly.
3. Thaw either in a microwave or refrigerator or under running water. Do not thaw at room temperature.
4. Do not thaw and refreeze.
5. Cook food thoroughly to reach the correct temperature for the specific type of food.
6. Store food protected at the proper temperature once prepared to avoid contamination. Do not allow food to sit uncovered at room temperature.
7. Avoid handling of food with bare hands; use proper, clean utensils such as tongs and spoons.

8. Use separate cutting boards for raw meat, poultry, fish, raw fruits and vegetables and cooked food unless boards are non-absorbent (and will not scratch, chip, or crack) and can be cleaned and sanitized adequately between uses.
9. Use clean equipment and utensils during food preparation and avoid cross-contamination.

**F. Transport, display and serving**

1. Transport food to different areas while protected in temperature-controlled carts.
2. Establish safe times for food items to be stored in inpatient care areas.
3. Protect food on display from customer contamination by the use of easily cleanable counter protector devices.
4. Maintain food on display at the proper temperature, whether hot or cold.

**G. Washing and cleaning**

1. Establish comprehensive cleaning schedules to include different areas, equipment, fixtures, and physical facility structures (e.g., walls, floors).
2. Monitor dishwasher washing and rinsing temperature to achieve proper sanitation and cleaning of food utensils.
3. After manual washing, sanitize all utensils and equipment either with hot water (70°C) or the use of sanitizer (sodium hypochlorite) with the appropriate concentration and exposure time.
4. Wash all working surfaces: thoroughly rinse and sanitize them after each use with the proper sanitizer, dilution, exposure time and water temperature.

**H. Water**

1. Use clean, potable and safe water in the food service facility. Test water routinely for its quality and potability.

**I. Ice machine**

1. Use ice-dispensing machines (preferably).
2. Use potable water for ice making.
3. Clean and disinfect ice machines routinely according to a written procedure.
4. Use a clean scoop to dispense ice. Do not handle ice with bare hands.

**J. Waste management**

1. Store garbage in leak- and pest-proof containers with tight-fitting covers.
2. Store all garbage containers either outdoors or above a smooth surface of non-absorbent material.
3. Wash containers and sanitize them routinely in an area provided with a floor drain connected to a sanitary sewer.

**K. Pest control**

To prevent the access of pests to food areas and allow for extermination, if necessary, follow appropriate pest control measures (e.g., sanitation, screens, closure of cracks and holes).

**L. Maintenance**

Identify and follow a cleaning and sanitization procedure for each piece of equipment used in food services.

TITLE/DESCRIPTION: <b>LAUNDRY</b>		INDEX NUMBER: <b>ICM – VIII-02</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To describe infection control practices for the hospital laundry to protect workers from exposure to potentially infectious materials during the collection, handling and sorting of soiled linen, which may be contaminated with blood and body fluids or other infectious material. Also, to describe infection control standards for the laundering process to restore soiled linen to a usable condition.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 101: Laundry, patient linens, textiles. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Center for Disease Control and Prevention (CDC). (2001). Guidelines for environmental infection control on healthcare facilities, pp 88-92.

## COMMENTS

1. There are very few reported cases of healthcare-associated infections linked to contaminated fabrics. The overall risk of actual disease transmission is insignificant.
2. To reduce the possibility of occupational risks of infection transmission and/or exposure, laundry workers should focus on:
  - a. Appropriate and frequent hand hygiene.
  - b. Appropriate use of personal protective equipment (PPE).
  - c. Removal of foreign objects from soiled linen.
3. To restore soiled linen to usable condition, washing, bleaching, rinsing, and drying are necessary.

## PROCEDURES

### A. Personal protective equipment (PPE) and hand hygiene

1. All staff must be trained in the collection, transport, sorting and washing of soiled linen using the appropriate infection control measures, such as hand hygiene, wearing PPE and adhering to standard precautions. Refer to policy [ICM-II-04 Hand Hygiene](#).
2. Staff must be educated in the use of PPE. Refer to policy [ICM-II-03 Standard Precautions](#)
  - a. When and what is needed
  - b. How to put on correctly
  - c. Where to dispose of used PPE
3. PPE requirements differ depending on the assigned area of the laundry.

## B. Collecting contaminated textile/linens

1. Nursing:
  - a. Contaminated linen should be bagged at the site of generation in a manner that minimizes agitation and prevents contamination of the environment and personnel.
    - i. Do not shake contaminated linen when removing it from the bed.
  - b. Collect soiled linen in such a fashion as to keep the heavily soiled portion contained in the center by folding or rolling the soiled spot into the center. This action will reduce the risk of contamination and prevent leakage from soaking through.
    - i. When available, bags soluble in hot water can be used for heavily soiled linen. Roll linen as mentioned above and place it in the clear, water-soluble bag and then into the laundry bag.
  - c. Care should be taken before placing soiled linen in a laundry bag to ensure that all non-textile items, including instruments, needles, or plastic single-use under pads, are removed. These items can cause extensive damage to laundry equipment.
    - i. Items of this nature present the greatest risk to the HCW of acquiring a bloodborne infection.
    - ii. Ensure that the patient's personal items (e.g., dentures, eyeglasses, and hearing aids) are not left in the linen.
  - d. Place full and tied off soiled linen bags in the dirty utility room or a designated area for pickup by laundry staff. Linen bags must not be placed on the floor; use a bin or rack to keep the bags 8 to 10 inches off of the floor.
  - e. Linen from isolation rooms is considered regular soiled linen.
2. Laundry staff:
  - a. Linen should not be sorted or pre-rinsed in patient care areas.
  - b. Care should be taken when removing laundry bags from these areas. Do not overfill the carts.
  - c. Do not hold bags close to the body; this step will help prevent the possibility of sharps injury from forgotten items in the linen.

## C. Transporting linens to the laundry

1. Bags can be transported from the point of collection to the laundry or to another designated holding area by covered handcart or chute.
2. Bagged textiles should be transported to the laundry at regular intervals or at least daily.
3. Carts, liners, and bags should be washed and disinfected daily and when visibly soiled.

## D. Sorting soiled linen

1. All personnel involved in the sorting and washing of contaminated healthcare linen should:
  - a. Be appropriately trained
  - b. Have adequate access to hand hygiene facilities
  - c. Use PPE (overalls, mask, head cover, heavy duty gloves, and boots)
2. The bagged linen should be delivered to the 'soiled' area of the laundry.
3. It is important to be alert for sharp objects while sorting linen. If found, sharps must be disposed of appropriately. Refer to policy [ICM-IX-02 Waste Management](#).

## E. Laundering process (washing, rinsing, drying)

The laundering process is designed to remove organic soil and render the linen clean. The correct amount of each chemical (at an adequate dilution), the mechanical action of the equipment, the water flow, the water temperature, the timing (cycles), and drying must be optimized as part of the process.

1. **High temperature:** A temperature of at least 71°C (160°F) for a minimum of 25 minutes is normally recommended for the hot water wash cycle.
2. **Low temperature:** A lower temperature of 22°C-50°C (71°F-77°F) can satisfactorily reduce microbial contamination in the washer.
3. The washing cycles (one for bleach wash), series of rinses, and the last rinse will neutralize any residual chemicals.
4. The amount of residual chlorine (bleach) should be between 50 and 150 ppm and must be monitored and controlled.

#### F. Clean linen

1. Transport and store clean linen in such a way as to ensure its cleanliness and protect it from dust and soil during loading, transport and unloading.
2. Transport clean linen in carts that have been cleaned and disinfected.
3. Cover or wrap linen before and during transport as well as during storage.
4. Store clean linen, covered, in a clean area, and separated from potential sources of contamination.
5. Transport clean linen separately from soiled linen.

#### G. Needle/sharps injuries

1. Instruct laundry employees to report any sharps injury occurring when handling linen as well as any improperly disposed sharps or needles.
2. Provide a sharps container in the soiled linen area to dispose of any sharps found in the linen.

#### H. Physical Facility

1. Separation of clean and soiled linen:
  - a. Separate the areas for sorting and processing soiled linens from the areas for ironing, folding and storing clean linen.
  - b. Separate the abovementioned areas with physical barriers and ensure appropriate ventilation.
2. Ventilation:

Maintain areas receiving soiled linen at negative air pressure relative to clean areas or ensure positive air flow from the clean linen area to the soiled linen area.
3. Hand hygiene facilities:
  - a. The laundry areas must have hand hygiene facilities (soap, water, paper towels, or alcohol hand rub) and PPE available for workers.

TITLE/DESCRIPTION: <b>PHARMACY</b>		INDEX NUMBER: <b>ICM – VIII-03</b>
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## DEFINITION

To provide clear guidelines for pharmaceutical staff on the correct procedures for preparation, storage and monitoring of sterile products kept in the pharmacy and to prevent the contamination of sterile products prepared in the pharmacy.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 20: Aseptic technique. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 61: Pharmacy services. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)

## COMMENTS

1. Refer to hospital's pharmacy policies.
2. Patient morbidity and mortality can result from contaminated pharmaceutical items. Sterile pharmaceutical products can become contaminated via two general methods:
  - a. **Intrinsic contamination:** occurs during the manufacturing process.
  - b. **Extrinsic contamination:** occurs subsequent to manufacturing; during the admixture process or while the infusate is used.

## PROCEDURE

### A. Aseptic Technique

1. Failure to utilize aseptic technique can result in the contamination of pharmaceuticals and has been associated with epidemics.
2. Hand scrubbing is required before each procedure. Remove any hand/wrist jewelry and scrub nails, hands and forearms with antimicrobial soap before handling sterile products.
3. Wear a gown closed at the collar with knit cuffs, a facemask, shoe covers, hair covers, and a cover for facial hair, when applicable, upon entering the preparation area.
4. Personnel preparing intravenous (IV) admixtures should wear sterile gloves. Gloves should be removed when exiting the preparation area. Gloved personnel should not touch any surface outside of the hood.
5. Disinfect the rubber stoppers of containers and the diaphragms of vials with a 70% alcohol wipe prior to use.
6. Use a sterile device (e.g., a needle) each time a vial is accessed and avoid touch contamination of sterile supplies.
7. Procedures should be developed to validate the aseptic technique for each person preparing sterile products and repeated at periodic intervals.
8. Do not eat, drink or smoke in the preparation area.

## B. Engineering controls

**Process:** All sterile products should be prepared in a class 100 environment, no greater than 100 particles per square foot, which can be achieved with the use of a certified vertical or horizontal laminar air flow hood.

### Use of the laminar air flow hood (LAFH)

1. Operate the LAFH continuously. Before processing sterile products, the hood should be running for a period of time long enough to purge room air from the work area (at least 30 minutes or as per the manufacturer's recommendations).
2. Do not disrupt the air flow between the HEPA filter and any sterile objects to avoid contamination.
3. Complete all work at least 6 inches from the edge in the interior of the LAFH.
4. Disinfect the work surfaces and all accessible interior surfaces of the hood with a hospital-approved disinfectant before beginning work.
5. Clean the exterior surfaces of the hood daily with a hospital-approved disinfectant.
6. Inspect the containers of the ingredients used to prepare the sterile product for defects, product integrity, and the expiration date.
7. Do not use defective or expired products.
8. Defective products should be reported to the Ministry of Health using the Drug Quality Report.
9. Disinfect the entire surface of all ampoules, vials and containers with 70% isopropyl alcohol before entry into the LAFH, and allow them to air dry.
10. Handle all ampoules, vials, needles and syringes in such a way as to maintain asepsis and avoid unnecessary turbulence within the LAFH.
11. Ensure certification of the LAFH annually, or more frequently as needed, and maintain certification records.

## C. Sterile product preparation area

1. Should be functionally separate from other areas.
2. Should have a controlled air flow under positive pressure that should not be disrupted by air ducts, vents or excess traffic that could produce air currents, introducing contaminants.
3. Should be free of particle-shedding materials such as cardboard boxes or powdered gloves. Such materials should not be stored in any area surrounding the hood.
4. Should not have carpets, drapes or other particulate-shedding materials in the preparation area.
5. Should have minimal personnel traffic confined to those persons directly engaged in IV admixture procedures or their supervision.

## D. Quality control monitoring

1. Use single-dose vials whenever possible for admixing parenteral preparations.
2. Monitor the temperature of refrigerators used in pharmacy to store medications continuously and set alarms to indicate excessively high or low temperatures.
3. Examine the final sterile product for any leaks, cracks, turbidity or particulate matter.
4. Label all mixed parental fluids with the following information:
  - a. Patient Name (for patient-specific products).
  - b. Medical record number, patient location.
  - c. Solution and ingredient names and concentrations.
  - d. The administration regimen names and concentrations.
  - e. The expiration date and time.
  - f. Storage requirements.

- g. Identification of the responsible pharmacist by badge number.
- h. Appropriate additional labeling, such as any precautionary measures that need to be taken.
- i. Device-specific instructions.
- j. Any additional information in accordance with local regulations or requirements.

#### **E. Storage**

The pharmacy is responsible for the appropriate storage of pharmaceuticals throughout the institution. The following applies to parenteral admixtures:

1. Store parenteral admixtures according to the manufacturer's recommendations.
2. Remove expired medication from patient care areas, and ensure its proper disposal.
3. Store admixed parenteral solutions in the refrigerator for up to 1 week, provided that refrigeration begins immediately after preparation and is continuous. The stability of admixed ingredients may dictate a shorter or longer refrigeration period.

#### **F. Pharmacy responsibilities involving antimicrobial control**

Concerns about antimicrobial resistance causing increased morbidity, mortality and healthcare costs have led to recommendations for controlling antimicrobial use.

1. Establish a system to control and monitor antimicrobial usage.
2. Participate in the development of programs for formulary and antimicrobial control.
3. Collaborate with physicians regarding patient-specific recommendations for antimicrobial use.

#### **G. Multi-dose vials (MDVs) containing preservatives**

1. Date, time and initial all MDVs once opened or reconstituted.
2. Refrigerate any opened MDV as recommended by the manufacturer.
3. Clean the rubber diaphragm of the MDV with 70% isopropyl alcohol before inserting a device into the vial.
4. Access the MDV with a sterile device each time.
5. Avoid touch contamination of the MDV.
6. Discard the MDV when empty, when suspected or visible contamination occurs, or when the manufacturer's expiration date (listed on the vial - e.g., 30 days) is reached.

#### **H. Multi-dose vials (MDVs) without preservatives**

1. Expiration date for MDVs without preservatives will be the manufacturer's recommended date listed on the vial (e.g., 24 hours at room temperature or 72 hours in the refrigerator from first vial entry).
2. Date, time and initial all MDVs once opened or reconstituted.

TITLE/DESCRIPTION: <b>ENDOSCOPY</b>		INDEX NUMBER: <b>ICM – VIII-04</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide recommendations for cleaning, disinfecting and sterilizing endoscopes and their accessories to minimize the risk of infection transmission between patients.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 47: Endoscopy. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Rutala WA and Weber DJ. Disinfection of Endoscopes: review of new chemical sterilants used for high level disinfection. *Infection Control Hospital Epidemiology*, 1997; 20:69-76

## COMMENTS

1. Flexible endoscope has become an invaluable diagnostic and therapeutic tool. As with all diagnostic and therapeutic procedures, there are always intrinsic and extrinsic risks of complications. To minimize the risk of infection, healthcare providers must ensure that equipment is designed and maintained properly and that guidelines for reprocessing are strictly followed.
2. Reprocessing requires meticulous cleaning and high-level disinfection or sterilization of internal channels, external surfaces, openings, valves and caps. Accessory equipment used to biopsy, brush, or cut tissue must be cleaned and sterilized or discarded if it is disposable.
3. Some disinfectants are inactivated by organic material. Organic soil including blood, excretions, and embedded microbes may contribute to disinfectant failures and prevent the penetration of germicides.

## DEFINITIONS

1. **Chemical sterilants** refer to liquid chemical agents cleared by the Food and Drug Administration (FDA) for reprocessing reusable medical devices. These products are considered high-level disinfectants or sterilants depending upon the recommended time, temperature and concentration and their sporicidal activity. Manufacturer's instructions must be followed.
2. **Cleaning** refers to the physical removal of organic and inorganic material from objects and surfaces.
3. **Endogenous infection** (e.g., cholangitis, pneumonia) occurs when the microflora colonizing the mucosal surfaces of the GI or respiratory tract gain access to the bloodstream or other normally sterile body sites as a consequence of the endoscopy procedure.
4. **Endoscope** refers to a flexible device used to visualize the interior of a hollow organ.
5. **Endoscope accessory** refers to biopsy forceps, brushes, snares, or other devices introduced through the internal channel of the endoscope during procedures.

6. **Exogenous infection** occurs when microorganisms are transferred from previous patients or the inanimate environment via contaminated endoscopes or accessories. The most common factors associated with transmission include inadequate manual cleaning, inadequate exposure of all endoscope surfaces to the sterilant, inadequate rinsing and drying, and the use of automated endoscope reprocessors.
7. **High-level disinfection** is the elimination of all forms of microbial life with the exception of large numbers of bacterial spores.
8. **Reprocessing** refers to the cleaning and high-level disinfection or sterilization of reusable endoscope devices either by manual or automated methods.
9. **Sterilization** is the complete elimination or destruction of all forms of microbial life.

## RECOMMENDATIONS

### A. Processing endoscopes and accessories:

1. If an automated endoscope washer disinfectant (AEWD) is used, ensure that the endoscope and its components can be effectively reprocessed in the AEWD. Obtain and review model-specific reprocessing protocols from the endoscope and AEWD manufacturers and check for compatibility.
2. Reusable endoscope accessories (e.g., biopsy forceps or other cutting instruments) that break the mucosal barrier should be mechanically cleaned as described earlier and then sterilized between each patient use (high-level disinfection is not appropriate).
3. Endoscopes (and accessories) that come in contact with mucous membranes are classified as semi-critical items and should receive at least high-level disinfection after each patient use.
4. All endoscopes received for reprocessing must have the following information logged:
  - a. Patient name
  - b. Medical record number
  - c. Procedure and endoscopist
  - d. Identification number of endoscope used (serial number)
  - e. Identification of the endoscope disinfectant used
5. Perform pressure/leak testing after each use according to the manufacturer's guidelines.
  - a. Observe the instrument carefully for continuous bubbling. If continuous bubbling is observed from a given area, this indicates a leak. Remove the instrument from water immediately after the leak test cycle. Do not use the instrument.
  - b. Dry and clean the instrument, place it in a plastic bag and pack it into the transport case. Contact the appropriate department for repairs.
6. Disconnect and disassemble endoscope components (e.g., air/water and suction valves) as far as possible and completely immerse the endoscope and components in the enzymatic detergent.
7. Cleaning is essential before manual or automated disinfection.
  - a. Meticulously clean the entire endoscope immediately after use, including valves, channels, connectors, and all detachable parts, according to the manufacturer's instructions, using an enzymatic detergent compatible with the endoscope.
  - b. Flush and brush all accessible channels to remove all organic (e.g., blood, tissue) and other residue. Repeatedly actuate the valves during cleaning to facilitate access to all surfaces.
  - c. Clean the external surfaces and components of the endoscope using a soft cloth, sponge, or brushes.

8. For cleaning, use brushes appropriate for the size of the endoscope's channel, parts, connectors, and orifices (e.g., bristles should contact all surfaces). Cleaning items should be disposable or thoroughly cleaned and disinfected/sterilized between uses.
9. Ultrasonic cleaning of reusable endoscope accessories and endoscope components may be used to remove soil and organic material from hard-to-clean areas.
10. Select a disinfectant/sterilant that is compatible with the endoscope. Exposure time, concentration, and temperature for disinfection of the scope must be chosen according to the manufacturer's recommendations.
11. After high-level disinfection, rinse the endoscope and flush the channels with sterile, filtered, or tap water to remove the disinfectant/sterilant. Discard the rinse water after each use/cycle.
  - a. Flush the channels with 70%–90% ethyl or isopropyl alcohol and dry using forced air. The final drying steps greatly reduce the possibility of recontamination of the endoscope by waterborne microorganisms. For storage, refer to the section on Storage of Clean/Sterile Endoscopes.
12. Perform high-level disinfection or sterilization of the water bottle (used for cleaning the lens and irrigation during the procedure) and its connecting tube at least daily. Sterile water should be used to fill the water bottle.
13. Perform routine testing of the liquid sterilant/high-level disinfectant to ensure the minimal effective concentration (MEC) of the active ingredient.
  - a. Check the solution on a regular basis and document the results. If the chemical indicator shows that the concentration is less than the MEC, the solution should be discarded.
14. Discard the liquid sterilant/high-level disinfectant at the end of its reuse life (which may be a single use), regardless of the MEC. If additional liquid sterilant/high-level disinfectant is added to an AEWD (or basin, if using manual disinfection), the reuse life should be determined by the first use/activation of the original solution (i.e., the practice of "topping off" a liquid sterilant/high-level disinfectant pool does not extend the reuse life of the liquid sterilant/high-level disinfectant).
15. Discard enzymatic detergent after each use because these products are not microbicidal and will not retard microbial growth.

**B. Safety and quality control:**

1. Policy and procedures on device-specific reprocessing instructions must be written and followed by all CSSD personnel.
2. Operate AEWD or automated endoscope reprocessor systems as per the manufacturer's recommendations.
3. The CSSD technician must carry out quality control testing on a regular basis.
4. Diagnostic testing must be carried out and passed prior to instruments being loaded.
5. Material and Safety Data Sheets must be obtained for each chemical used and stored in the department. Spill kits and respirators must be available in the cleaning area in the event of a chemical spill.
6. Use the correct amount or dilution of chemicals required for each load.
7. Filters must be changed as per the manufacturer's instructions.
8. Healthcare facilities should develop protocols to ensure that users can readily identify whether an endoscope is contaminated or ready for patient use.

**C. Quality control sampling:**

The utility of routine environmental microbiological testing of endoscopes for quality assurance has not been established.

**D. Design of the endoscopy suite:**

There are a number of factors to be considered in the design and use of space for endoscopy procedures and the cleaning, disinfection, sterilization and storage of endoscopes and their accessories.

1. Separate the space used for the performance of procedures from the space used for cleaning and sterilization of equipment.
2. Provide separate, designated sinks for hand hygiene and utility.
3. Air exchange in the suite should meet the latest CDC guidelines to prevent the transmission of tuberculosis: 12 air changes per hour are required.
4. The area should be planned to allow for sound infection control practices (e.g., avoidance of proximity between clean and contaminated equipment).
5. Do not allow eating or drinking in procedure and utility rooms.

**E. Reprocessing technicians:**

1. Personal protective equipment (gloves, gowns, eyewear, respiratory protection devices, etc.) should be readily available and should be used as appropriate to protect workers from exposure to chemicals, blood, or other potentially infectious material.
2. Strict use of hand hygiene by all healthcare workers is required.
3. All healthcare personnel assigned to reprocess endoscopes should be trained in and adhere to standard infection control recommendations, including those to protect both patients and healthcare workers.
  - a. Personnel should receive device-specific reprocessing instructions to ensure proper cleaning and high-level disinfection or sterilization.
  - b. Competency testing of personnel should be carried out regularly (e.g., annually).
  - c. Temporary personnel should not be allowed to reprocess endoscopes until competency has been established.
4. All personnel using chemicals should be educated about the biological and chemical hazards present while performing procedures that use disinfectants.

**F. Cleaning and disinfection area:**

1. Space used for cleaning, disinfecting, and sterilizing should have adequate ventilation to exhaust toxic vapors.
2. Air-exchange equipment (ventilation system, exhaust hoods, etc.) should be used to minimize the exposure of all persons to potentially toxic vapors released from chemical sterilants.
3. The air system should provide at least 12 air changes per hour for negative room pressure.
4. The utility sink used to clean instruments should be functionally separate from the hand hygiene sink and be large enough to accommodate the endoscope and accessories.
5. Adequate space should be designated for the storage of chemical sterilants, with consideration given to their special handling requirements as hazardous materials.
6. Cleaning/disinfection and sterilization should be carried out by trained personnel only.

**G. Storage of clean/sterile endoscopes:**

1. Examine and test the endoscope for proper angulation before storing. Hold the fiberscope with both hands when storing to prevent it from banging against cupboard, thereby damaging the fiberoptic bundles.
  - a. When storing the endoscope, hang it in a vertical position to facilitate drying (with caps, valves and other detachable components removed as per the manufacturer's instructions).
2. Endoscopes should be stored in a vertical manner that will protect the endoscope, minimize the potential for residual moisture accumulation and allow for proper air flow to ensure that endoscopes are kept dry.
3. Cabinets used for drying and storage of endoscopes should be constructed of a material that can be cleaned easily.
4. Endoscopes should not be stored in foam-lined cases because foam lining is impossible to clean and harbors contamination.
5. Endoscopes should be stored in a manner that will protect the endoscope from contamination.

TITLE/DESCRIPTION: <b>OPHTHALMOLOGY CLINIC</b>		INDEX NUMBER: <b>ICM – VIII-05</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

Provide the guidelines for the appropriate disinfection instruments and the use and storage of multi-dose vials in the ophthalmology clinic.

## REFERENCE

Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 120: Infection prevention in ophthalmology. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)

## COMMENTS

1. Outbreaks can occur in an ophthalmology setting due to cross-contamination of tonometer tips and multi-dose vials.
2. Outbreaks of epidemic keratoconjunctivitis due to adenovirus type 8 have been documented in ophthalmology clinics and linked to inadequately disinfected tonometer tips.

## PROCEDURE

### A. General recommendations

1. Hand hygiene (HH) facilities (sinks and alcohol hand rub) must be available in each patient care area.
2. Healthcare workers (HCWs) must observe Standard Precautions (e.g., HH and use of personal protective equipment (PPE)) when exposure to blood or body substances is anticipated.
  - a. Adequate PPE should be available to meet clinical requirements at all times.
3. Clean and sterile items may be stored in the same area.
4. Cleaning of items in preparation for disinfection/sterilization should take place the dirty utility room.
5. Food and drink is not allowed in the patient care area.
6. Personal effects (bags, books, magazines) should be stored in staff lockers and not in patient care areas.
7. All horizontal surfaces should be cleaned daily and between patient visits with a hospital-approved (tuberculocidal) disinfectant. Clean surfaces immediately when visibly soiled.
8. A hospital-approved sharps disposal container should be available at the point of care in all patient care areas.
9. Medication must be stored in a designated refrigerator or cupboard. Food items should not be stored together with medication.
10. A program for refrigerator cleaning and temperature monitoring should be established, with adequate record keeping.

**B. Medication (including multidose vials (MDVs))**

1. Medication intended for internal or external use should be labeled accordingly and stored separately. Refer to policy [ICM-VIII-03 Pharmacy](#).
2. Date, time, and initial all MDVs once opened or reconstituted.
3. Refrigerate any opened MDV as recommended by the manufacturer.
4. Clean the rubber diaphragm of the MDV with 70% isopropyl alcohol before inserting a device into the vial.
5. Access the MDV with a sterile device each time.
6. Avoid touch contamination of the MDV.
7. MDVs should be accessed with a sterile needle each time, and the needle should be removed upon completion. The needle should not be left as a means of permanent access because it will provide a point of entry for microorganisms.
8. Eye medication (drops, ointments) intended for single-patient use only should be discarded once treatment is completed.
9. Applicators for eye medications intended for single use should not come in contact with the eye or periorbital area. A separate applicator should be used for each eye and labeled accordingly.
10. Discard the MDV when empty, when suspected or visible contamination occurs, or when the manufacturer's expiration date (listed on the vial - e.g., 30 days, 24 hrs, or 72 hrs) is reached.

**C. Disinfection of ophthalmology instruments**

1. General recommendations
  - a. Steam sterilization is not recommended for ophthalmology instruments.
  - b. Instruments that are visibly soiled should be washed with a hospital-approved detergent and water with rubbing prior to disinfection.
2. Tonometer tips

In a busy ophthalmology clinic, a fast and effective method of disinfection is recommended:

  - a. The tonometer tip should be cleaned and disinfected immediately after use.
  - b. The tonometer tip may be disinfected by one of the two following methods:
    - i. *Isopropyl Alcohol (70%)*
      - The tonometer tip should be wiped clean and then disinfected with 70% isopropyl alcohol.
      - Apply 70% isopropyl alcohol to all surfaces of the tonometer tip, ensuring that the entire surface is treated.
      - Apply friction to clean the surfaces. The mechanical wiping action contributes to the effective removal of microorganisms.
      - Allow the alcohol to air dry completely to promote effective disinfection and to ensure that no residual alcohol is transferred to the ocular surface.
    - ii. *Hydrogen peroxide (3%)*

The tonometer tip should be wiped clean and then disinfected with 3% hydrogen peroxide.

      - Apply 3% hydrogen peroxide to all surfaces of the tonometer tip, ensuring that the entire surface is treated.
      - The hydrogen peroxide should be in contact with the tonometer surface for at least 5 minutes.
      - Using a hydrogen peroxide-soaked sponge, apply friction to clean all surfaces of the tonometer tip.
      - Rinse the tonometer thoroughly with distilled water to ensure removal of the hydrogen peroxide.
      - Dry the tonometer with a disposable clean tissue following the disinfection process.

### 3. Laser lenses

Before cleaning, disconnect the power plug.

#### a. Cleaning of optical surfaces (lenses):

The lens should be cleaned and disinfected immediately after use.

- i. Wash the lens thoroughly with soap and water.
- ii. Rinse the lens.
- iii. Dry the lens with a paper towel.
- iv. Apply 70% isopropyl alcohol to all surfaces of the lens. Allow to air dry.
- v. Replace the lens in a clean box.

#### b. Cleaning of painted surfaces:

Never use aggressive or abrasive cleaning agents; always use disinfectants approved by the product evaluation committee at the hospital.

- i. Clean and disinfect the entire instrument and its case.
- ii. In cleaning and disinfecting the equipment, make sure that no moisture gets into the device or the foot switch.

TITLE/DESCRIPTION: <b>RESPIRATORY THERAPY</b>		INDEX NUMBER: <b>ICM – VIII-06</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To describe Infection Control standards for respiratory therapy services and to avoid any improper handling of respiratory care equipment that may lead to increased incidence of healthcare-associated infections.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 63: Respiratory care services. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Centers for Disease Control and Prevention (CDC). Guidelines for prevention of nosocomial pneumonia. *MMWR* 1997; 3;46 (RR-1):1-79.
3. Hess D, Burns E, Romagnoli D, and Kacmarek R. Weekly ventilator circuit changes. A strategy to reduce costs without affecting pneumonia rates. *Anesthesiology* 1995; 82:903-911
4. Kollef MH, Shapiro SD, Fraser VJ, et al. Medical ventilation with or without 7-day circuit changes. A randomized controlled trial. *Ann Intern Med* 1995; 123:168-174
5. Vincent JL. Prevention of nosocomial bacterial pneumonia. *Thorax* 1999; 54 (6): 544-9

## COMMENTS

1. Certain interventions used by the Respiratory Care Service may influence infection risks to patients and HCWs.
2. Mechanical ventilation, ventilator circuit channels, handling of condensate, use of nebulizers, suction catheters and humidification methods are potential infection risks.
3. Routes of transmission of pathogens most commonly associated with respiratory care are airborne, droplet nuclei and direct contact with contaminated fluids such as secretions, saliva, sputum, blood, or condensate in aerosol tubing or a ventilator circuit.
4. Transmission of pathogens in fluid occurs when the fluid physically moves, flows, or spills from one area to another.
5. Direct contact with hands or equipment is thought to be a common mode of transmission.
6. Routes of transmission may be from practitioner or device to patient, from one patient to another, or from one body site to the lower respiratory tract of the same patient, via the hands or a device.
7. Nebulizers with reservoirs can allow for the growth of hydrophilic bacteria that can be nebulized to the patient during device use.
8. Gram-negative bacilli such as *Pseudomonas* spp., *Stenotrophomonas* spp., *Flavobacterium* spp., *Legionella* spp., and non-tuberculosis mycobacteria can multiply to substantial concentrations in nebulizer fluid and increase the risk of acquiring pneumonia.

9. Sterilization or high-level disinfection can eliminate vegetative bacteria from device reservoirs, making the reservoirs safe for patient use.
10. Improved VAP incidence has been reported when using a closed-suction versus an open-suction system. Elimination of routine closed-system suction catheter changes increases safety and reduces the costs of mechanical ventilation.

## PROCEDURE

### A. Standard precautions

1. Use standard precautions for all patient care. Refer to policy [ICM-II-03](#) *Standard Precautions*.
2. Use personal protective equipment (PPE) singly or in combination for any or all of the following procedures as indicated:
  - a. Wear gloves for handling respiratory secretions and objects contaminated with the respiratory secretions of any patient.
  - b. Wear face protection (mask and goggles) when contamination of the face with aerosolized particles is likely.
  - c. Wear an N95 particulate mask when managing patients with suspected or confirmed pulmonary tuberculosis. Refer to policy [ICM-V-03](#) *Management of Suspected/Confirmed Cases of Infectious Tuberculosis*.
3. Wear PPE when contact with the respiratory secretions from a patient is likely.
  - a. Change the PPE after such contact and before providing care to another patient.
4. Follow the required isolation precautions when entering the rooms of patients in isolation. Refer to protocols in the following policies: [ICM-III-03](#) through [ICM-III-05](#) *Contact Isolation, Droplet Isolation, Airborne Isolation Precautions*.
5. Respiratory equipment (ventilator, monitors, etc.) in use should be cleaned regularly (when visibly soiled, daily, and when patient is discharged) to reduce environmental contamination.
6. All reusable respiratory items requiring disinfection and sterilization must be sent to the Central Sterile Supply Department (CSSD).

### B. Hand hygiene

1. Wash or cleanse hands and dry them thoroughly before and after all contacts with the patient and the patient's environment; refer to policy [ICM-II-04](#) on *Hand Hygiene*.
2. Wash and dry or cleanse hands before and after glove use.

### C. Mechanical ventilation and humidifiers

1. Use high-efficiency bacterial filters in the breathing circuit of the ventilation unit.
2. Ensure that the patient is positioned with his/her head elevated at a 30° to 45° angle, except during postural drainage procedures, to minimize aspiration of secretions.
3. Use filters on the inspiratory limb to eliminate contaminants from entering the inspired gas and contaminating the ventilator.
4. Place bacterial filters appropriately to avoid any potential interference with the operating characteristics of the ventilator by impeding high gas flow.
5. Carefully test reusable filters periodically to ensure efficient functioning.
  - a. These filters must be reprocessed by CSSD.
6. Use closed continuous-feed humidification on all ventilator circuits to minimize/prevent aerosols, thus preventing the transmission of bacteria from the humidifier reservoir to patients.
7. Use sterile water to fill humidifiers. Heated humidification systems often operate at temperatures that reduce or eliminate bacterial pathogens. Tap or distilled water may harbor *Legionella* spp. that are more heat-resistant than other bacteria.

8. Sterilization or high-level disinfection of reusable circuits, humidifiers and nebulizers between patients is recommended.
9. Disinfect in-line temperature sensors properly according to the manufacturer.
10. **The ventilator circuit**, including the ventilator tubing and filter, exhalation valve and humidifier, should be changed when visibly soiled or mechanically malfunctioning.
  - a. No maximum time between changes has been recommended for use of ventilator circuits with non-aerosol-generating humidifiers.
  - b. Circuits should not be routinely changed for infection control purposes. Increased VAP infection rates are associated with 48-hour circuit changes.
  - c. HMEs should be changed if there is gross contamination or mechanical malfunction.

#### D. Artificial airways

1. Elevate the patient head's between 30° and 45°, during the use of artificial airways, especially during feedings and for one hour following feedings, when not contraindicated.
2. Do not routinely deflate the cuff of the endotracheal tube to determine the filling volume of the cuff. Alternative techniques to assure proper cuff pressure (such as minimal leak or minimal occluding pressure) should be used.
3. Perform a tracheostomy when indicated using sterile technique. Elective tracheostomy should be performed in the operating room.
4. Use aseptic technique to change the airway tube.
5. Replace the tube with one that has undergone sterilization or high-level disinfection.

#### E. Condensate

1. Drain and discard any condensate that collects in the tubing of the ventilator to prevent it from draining toward the patient.
2. Use water traps to minimize spillage.
3. Place traps appropriately in the ventilator circuits so as to allow gravity to drain condensate continuously away from the patient.
4. Treat contaminated condensate as waste and properly dispose of it through the standard hospital waste system.
5. Use heated wire circuits to reduce/eliminate condensate formation in the ventilator circuit.
6. Set heated wire circuits so that a small amount of condensate forms on the inspiratory limb of the circuit, indicating 100% relative humidity.
7. Adjust the heated wire circuit properly to deliver the appropriate humidity to the patient.

**N.B:** Heat and moisture exchanger (HME) can increase dead space and resistance to breathing and, at the same time, provide less humidity than the active systems previously discussed, resulting in thick and obstructive secretions in some patients. To be effective, >70% of the gas entering the airway must be exhaled through the HME. Place HME between the ventilator circuit and the patient's airway.

  - a. If the humidity is decreased, it will result in damage to the epithelium of the respiratory tract, with potential occlusion of artificial airways, especially in infants and small children.
  - b. There is no CDC recommendation for preferential use of HME rather than heated humidifiers to prevent healthcare-associated pneumonia.
  - c. The HME should be changed when grossly contaminated or mechanically malfunctioning.
  - d. Vent circuits should not routinely be changed when using an HME.

#### F. Nebulizers

1. Large-volume nebulizers and mist tents:

Room humidifiers that create aerosols have been associated with nosocomial pneumonia secondary to contamination of their reservoirs. The CDC recommends that

aerosol-generating room humidifiers not be used unless they can be filled only with sterile fluids and be sterilized or undergo high-level disinfection every 24 hours.

- a. Reusable large-volume nebulizers, mist tents, and hoods should be subject to sterilization or high-level disinfection between patients and after every 24 hours of use on the same patient.
- b. Change disposable large-volume nebulizers every 72 hrs.
2. Small-volume medication nebulizers:  
Handheld and inline:
  - a. Use only sterile fluids that are dispensed aseptically
  - b. Disinfect or sterilize nebulizers between patients.
  - c. Disinfect and rinse nebulizers with sterile water and air dry after each treatment on the same patient.
  - d. Aseptically remove inline nebulizers from the ventilator circuit and disinfect or rinse nebulizers with sterile water, air drying between treatments.

### G. Suction catheters

Use standard precautions, including eye and face protection during aerosol-generating procedures, should be taken with all patient care activities.

1. **Open suctioning systems** require:
  - a. The use of a sterile catheter, sterile disposable gloves, and sterile normal saline if instillation is desirable.
  - b. Personal protective equipment when contact with respiratory secretions is anticipated.
2. **Closed suctioning systems** may offer better control of lung volume and lead to fewer arrhythmias and desaturation episodes at the expense of increased tracheal colonization.
  - a. Use only sterile fluid to remove secretions from the suction catheter.
  - b. Change inline suction catheters no less frequently than every 72 hrs.
3. Change the suction collection tubing and canisters between patients.

### H. Medication (including multidose vials (MDVs))

1. Medication intended for internal or external use should be labeled accordingly and stored separately. Refer to policy [ICM-VIII-03 Pharmacy](#).
2. Date, time, and initial all MDVs once opened or reconstituted.
3. Refrigerate any opened MDV as recommended by the manufacturer.
4. Clean the rubber diaphragm of the MDV with 70% isopropyl alcohol before inserting a device into the vial.
5. Access the MDV with a sterile device each time.
6. Avoid touch contamination of the MDV.
7. MDVs should be accessed with a sterile needle each time, and the needle should be removed upon completion. The needle should not be left as a means of permanent access because it will provide a point of entry for microorganisms.

### I. Specimen collection

1. Sputum/tracheal aspiration/bronchoscopy
  - a. The patient should clean his/her teeth, gargle, and rinse his/her mouth with water just prior to collection.
  - b. The best specimen is an early morning collection. Refer to hospital microbiology laboratory policies.
  - c. For tracheal aspiration, follow the nursing procedure guidelines that pertain to patient preparation and specimen collection.
  - d. Wear appropriate PPE ([ICM-II-03 Standard Precautions](#)) during sputum induction.

- e. Perform sputum inductions in a private room with 6 air exchanges per hour if possible. Keep the door closed during the procedure.
  - i. Ask the patient's visitors to leave the room during sputum induction.
2. Percutaneous blood gases
  - a. Perform hand hygiene and use gloves.
  - b. Perform adequate skin preparation on the patient with hospital-approved antiseptic.
  - c. Use sterile supplies.
  - d. Do not precool syringes by submerging them in ice water.
  - e. Avoid repeating unsuccessful arterial punctures with the same needle or cannula.
  - f. Handle all body fluids as if contaminated.
  - g. Dispose of and transport specimens as appropriate.

#### J. Respiratory devices

1. Resuscitation bags
  - a. Sterilization or high-level disinfection of bags between patients is recommended.
  - b. When using a bag on the same patient, rinse it clear with sterile water immediately when the bag valve is visibly soiled with secretions.
  - c. Reusable bags must be sent to CSSD for reprocessing.
2. Oxygen masks and cannulas
  - a. Change tubing and any device, such as a cannula and mask, used to deliver oxygen from a wall outlet between patients.
  - b. Restrict the use of bubble type humidifiers (BTHs) to appropriate situations. Humidifiers are not indicated for oxygen flow less than 4 L/min in adult patients under normal conditions. When operated at a flow above 10 L/min, a standard unheated BTH designed for oxygen delivery is less efficient than a humidifier and may create aerosols that can transmit bacteria.
3. Pulse oximetry
  - a. Disinfect probes immediately between patients according to the manufacturer's recommendations.
  - b. Avoid the use of clip-on probes over edematous areas.
  - c. Check the site frequently, repositioning the probe as necessary.
  - d. Reposition all probes at appropriate time intervals in accordance with the manufacturer's recommendations.
4. Pulmonary function testing (PFT)
  - a. Disinfect the surfaces of any device that comes into patient contact after each patient.
  - b. Do not routinely disinfect the internal machinery of PFT machines between uses.
  - c. Sterilize or disinfect any external devices (e.g., nose clips and mouthpieces) between patients according to the manufacturer's recommendations.
  - d. The use of low-resistance, high-efficiency filters has been advocated for use between the mouthpiece and the spirometer to minimize contamination between device and patient. This filter may also reduce HCW exposure to droplet nuclei generated by the patient during forced expiratory maneuvers.

#### K. Reprocessing respiratory care devices

1. Respiratory care devices have been classified as semicritical because they come into contact with mucous membranes but do not ordinarily penetrate body surfaces.
2. All single-use disposable devices must be discarded immediately after use.
3. Do not reprocess equipment and devices that are manufactured "for single use only"; refer to policy [ICM-IX-03 Single-Use Devices](#).
4. Proper cleaning and sterilization or high-level disinfection of reusable equipment is important to reduce infection.
5. All reusable equipment or devices must be sent to CSSD for reprocessing.

6. The manufacturer's recommendations must be made available to CSSD to efficiently and effectively clean, disinfect and sterilize these items.

#### L. Home Care

1. Open suctioning systems are primarily used in the home setting.
2. The common and accepted practice is a "clean" rather than sterile technique during suctioning.
  - a. "Clean" technique is using a clean, non sterile catheter, clean gloves, and clean hands.
3. The canister can be soaked in a weak solution of chlorine bleach according to the manufacturer's recommendations.
4. When reusing catheters, the following steps should be taken with respect to cleaning and disinfecting suction catheters, oral suctioning devices, supply hosing, and secretion traps in the system:
  - a. Thorough mechanical cleaning (i.e., with a brush) with detergent and hot water. Follow with one of the following:
    - i. A 60-minute soak in a solution of vinegar and water (1:3 solution); the vinegar solution should not be reused or
    - ii. A soak in a quaternary ammonium compound prepared and reused according to the manufacturer's specifications or
    - iii. A 20-minute glutaraldehyde soak or
    - iv. A 3% hydrogen peroxide flush followed by placement in a container of 3% hydrogen peroxide for a minimum of 20 minutes to soak. If hydrogen peroxide is used, the solution should be changed daily.
  - b. The equipment should next be thoroughly rinsed with sterile, distilled, or recently boiled water (used within 24 hours of boiling).
  - c. The equipment should be air dried and stored in a dust-free environment.
  - d. Used supplies and infectious waste must be disposed of promptly.

TITLE/DESCRIPTION: <b>REHABILITATION SERVICES</b>		INDEX NUMBER: <b>ICM – VIII-07</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide clear guidelines on infection control issues for patients, healthcare workers, and equipment to prevent the transmission of infections during the delivery of service.

## REFERENCES

Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 66: Rehabilitation services. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)

## COMMENTS

1. The rehabilitation patient may have one or more impairments or disabilities at the time of admission that increase the risk of infection.
2. Factors such as incontinence, skin breakdown, co-morbidity, immobility, and age are all associated with increased risks of infection in the rehabilitation population.

## PROCEDURE

### A. Rehabilitation standards

1. Treatment may require many different types of equipment to increase movement and mobility, heal wounds, and treat neurological and sensory impairments. Many patients also have secondary medical conditions that can affect the outcome of their rehabilitation.
2. The infection control needs of the patient must be known (whether for in-patient or out-patient procedures) before he/she is treated. Questions should include the following:
  - a. Does the patient have non-intact skin, open wounds, stasis ulcers, open burn wounds, or indwelling devices?
  - b. Does the patient have loose stools/diarrhea?
  - c. Does the patient have fecal or bladder incontinence?
  - d. Does the patient have any excretions or secretions that cannot be contained?
  - e. Did the patient have an extended ICU stay or surgery?
  - f. Is the patient willing or cognitively able to cooperate in strategies to contain his or her own body secretions?
  - g. Does the patient have an active or colonized infection of multidrug-resistant organisms?
3. The rehabilitation department must develop and implement policies and procedures to manage and minimize the risk of infection transmission.

**B. Rehabilitation personnel**

Staff should be able to apply the infection control principles and practices described in the Infection Control Manual during patient care activities. Basic infection control practices include the use of Standard Precautions with all patients receiving care regardless of their diagnosis or presumed infectious status. These practices are important for reducing the risk of disease transmission among patients and HCWs.

Rehabilitation Services staff are expected to:

1. Use standard precautions for all patient care. Refer to policy [ICM-II-03](#) *Standard Precautions*.
2. Use personal protective equipment (PPE) individually or in combination for any/all procedures that require close contact with the patient and the patient's environment regardless of whether the patient is in isolation.
3. Change PPE before providing care to another patient.
4. Wash or cleanse hands before and after all contact with the patient and the patient's environment. Refer to policy [ICM-II-04](#) on *Hand Hygiene*. Wash and dry or cleanse hands before and after glove use.
5. Follow required isolation precautions when entering the rooms of patients in isolation. Refer to Isolation Precautions, protocols [ICM-III-03](#) through [ICM-III-05](#) on *Contact Isolation, Droplet Isolation, and Airborne Isolation Precautions*.

**C. Rehabilitation environment**

Equipment used to provide rehabilitative services to patients may present an increased risk of infection to the patient, other patients, and HCWs. Written policies are needed to ensure that equipment is cleaned and disinfected between patients.

1. The department must have written guidelines for:
  - a. Routine cleaning and disinfection of equipment (canes, walkers, wheelchairs, weights, lifts, etc.) and toys following each patient use. Use only hospital-approved disinfectants to wipe down equipment.
  - b. Cleaning and disinfecting equipment after body fluid contamination (including whirlpools and hydrotherapy baths).
  - c. A method for documenting and validating that equipment has been cleaned and disinfected.
2. Some examples of cleaning in the therapy area are:
  - a. Treatment mats should be disinfected between uses.
  - b. Paper pillow covers should be changed between patients.
  - c. Pillow cases should be changed daily or as needed when body fluids are present (i.e., they are visibly soiled).
  - d. For types of equipment that cannot be cleaned, such as paraffin or therapy putty, patients must be instructed to wash their hands or feet before use. Patients wounds must cover with occlusive dressing or therapy must be delayed until the wounds are healed.
3. The water in hydrotherapy, whirlpools, and aquatic therapy pools can be a source of infectious organisms.
  - a. Maintain the proper levels of disinfectant in pools to control organic load.
  - b. The level of free available chlorine and the pH should be tested as per recommendations, and the results should be recorded and posted in the area. Acceptable chlorine levels are 1.5 to 2.0 ppm with pH ranging from 7.5 to 7.8.
  - c. Immersion tanks and whirlpools need to be cleaned with the appropriate disinfectant and following the manufacturer's recommendations.

4. Treatment tanks used with patients with non-intact skin require intermediate-level disinfection between each patient use.
5. Equipment with agitator jets must be disinfected with the solution covering the jets and the jets in circulation while disinfecting.
6. Single-use disposable patient care items are to be discarded immediately after use and are not to be reprocessed or reused (refer to policy [ICM-IX-03 Single Use Devices](#)).
7. Most items/equipment in this area are typically non-critical; however, for any semi-critical or critical reusable patient care items that require reprocessing, refer to policy [ICM-IX-01 Sterile Supplies and Equipment Management](#).

#### D. Infection control issues for the patient

Basic principles of infection control must be included in the delivery of service for all patients whether in in-patient or out-patient settings:

1. For all patients:
  - a. Standard precautions ([ICM-II-03](#)) must be used when providing care.
  - b. All drainages, wounds, and excretions must be contained before a patient can schedule therapies and activities.
  - c. The patient must be able to control secretions or excretions.
  - d. Equipment (rehab or physiotherapy equipment, stretchers, wheelchairs, etc.) must be cleaned and disinfected after each patient use. Only use hospital-approved disinfectants.
2. For a patient known to be infected or colonized with a multidrug-resistant organism (MDRO) (e.g., MRSA, VRE, or multidrug-resistant gram-negative organisms such as *Acinetobacter*) in the out-patient setting:
  - a. Use PPE individually or in combination for any/all procedures that require close contact with the patient.
  - b. Change PPE before providing care to another patient.
  - c. Designated equipment should be available when possible.
  - d. If therapy equipment cannot be designated, that patient should be scheduled at the end of the day.
  - e. The equipment (rehab or physiotherapy equipment, stretchers, wheelchairs, etc.) must be cleaned and disinfected after each patient use. Only use hospital-approved disinfectants.
  - f. The patient can participate in group activities only if he/she can:
    - i. Understand and follow basic hand hygiene practices
    - ii. Assist HCWs in containing his/her secretions and excretions
    - iii. Remain fully dressed
3. In-patients on contact isolation precautions:

A patient known to be infected or colonized with a multidrug-resistant organism (MDRO) (e.g., MRSA, VRE, or multidrug-resistant gram-negative organisms such as *Acinetobacter*) will be placed in contact isolation. Rehabilitation Service staff is expected to:

  - a. Follow the procedure described in [ICM-III-03 Contact Isolation Precautions](#).
  - b. Standard Precautions ([ICM-II-03](#)) must be used when providing care to all patients.
  - c. Factors to consider when preparing care plans for patients with multidrug-resistant organisms are:
    - i. How much care the patient needs
    - ii. Anticipation of the amount of contact with body fluids
    - iii. The patient's ability to control secretions or excretions
    - iv. The level of activity and mobility
    - v. Skin integrity and wounds
  - d. Barrier protection should be used to contain wounds, drainage, urine, feces, and other excretions or secretions whenever possible to allow for patient independence

and participation in therapeutic sessions or if patient has to leave his/her room. For example:

- i. The patient must have occlusive wound dressings, anchored urine bags, etc.
    - ii. The patient must be able to comply with hand hygiene protocols and stay fully dressed.
  - e. Use PPE individually or in combination for any/all procedures that require close contact with the patient and the patient's environment.
    - i. Change PPE before providing care to another patient.
  - f. Dedicated equipment is recommended. Equipment (rehab or physiotherapy equipment, stretchers, wheelchairs, etc.) taken into the room and used with a patient must be cleaned and disinfected after use. Only use hospital-approved disinfectants to wipe down equipment.
4. In-patient on airborne isolation precautions:

A patient suspected or confirmed to be infected with an airborne transmissible disease such as pulmonary TB, chickenpox, measles, or viral hemorrhagic fever will be placed in airborne isolation.

  - a. Follow the procedure in [ICM-III-05 Airborne Isolation Precautions](#).
  - b. Standard Precautions [ICM-II-03](#) must be used when providing care to all patients.
  - c. Factors to consider when preparing care plans for patients with airborne transmissible diseases are:
    - i. How much care the patient needs
    - ii. The amount of contact with body fluids (respiratory)
    - iii. The patient's ability to control secretions or excretions
    - iv. The level of activity and mobility
  - d. Barrier protections should be used to contain wounds, drainage, urine, feces, and other excretions or secretions whenever possible to allow for patient independence and participation in therapeutic sessions or if patient has to leave his/her room. For example:
    - i. The patient must have occlusive wound dressings, anchored urine bags, etc.
    - ii. The patient must be able to comply with wearing a surgical mask, practice proper hand hygiene and stay fully dressed.
  - e. Use PPE individually or in combination for any/all procedures that require close contact with the patient and the patient's environment. Wear an N95 mask for patients in airborne isolation. Immunity is the best protection for prevention of chickenpox transmission.
  - f. Change PPE before providing care to another patient.
  - g. Dedicated equipment is recommended. Equipment (rehab or physiotherapy equipment, stretchers, wheelchairs, etc.) taken into the room and used with the patient must be cleaned and disinfected after each use. Only use hospital-approved disinfectants.
  - h. Consideration of rescheduling therapy sessions for the end of the day or until patient is non-infectious is acceptable. Consult the Infection Control Practitioner if needed.

## E. Prevention of infections in rehabilitation settings

Factors such as incontinence, skin breakdown, co-morbidity, and age are all associated with increased risk of infection in rehab patients.

Failure to maintain skin integrity may cause increased infection and may extend the length of stay for the patients.

1. Treating Burn Patients
  - a. Treatment of the wound consists of meticulous cleansing and debridement of dead tissue.

- b. Apply topical ointments.
  - c. Use sterile technique and sterile dressings to control wound sepsis.
  - d. Use showers with hand-held spray for hydrotherapy. Use of a hydrotherapy tub or bath is discouraged due to the potential for contamination of the equipment and water.
2. Bladder and Bowel Issues
- a. Care of patients who are unable to control their bladder or bowel has to be a priority.
  - b. Keeping the patient's skin clean and dry is essential for good skin care.
    - i. Good perineal care
    - ii. Intermittent catheterization may be used (for neurogenic bladder, for example)
  - c. Recommendation for urinary tract infection prevention:
    - i. Follow the established guidelines for catheter use, insertion, and maintenance.
    - ii. Maintain asepsis for urinary catheter insertion.
    - iii. Maintain a sterile, closed drainage system and do not disconnect the catheter and drainage tube unless necessary.
    - iv. Utilize a condom catheter or in-and-out catheters when appropriate.
    - v. Keep the collection bag below the level of the bladder.
    - vi. Provide good catheter care on a regular basis.

## F. Spill management

The steps described below should be taken when cleaning and decontaminating spills of blood or other potentially infectious materials; refer to policy [ICM-IX-02 Waste Management](#).

When an infectious/medical waste spill has been identified, perform the following steps:

1. **Control** access to area
2. **Contain** the spill with paper towels or other absorbent materials
3. **Contact** housekeeping to disinfect the area

TITLE/DESCRIPTION: <b>DENTAL CLINIC AND DENTAL LABORATORY</b>		INDEX NUMBER: <b>ICM – VIII-08</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines on proper infection control practices in dental care settings.

## REFERENCES

1. American Dental Association. Infection control recommendations for the dental office and the dental laboratory. *J Am Dent Assoc* (Suppl), August 1992.
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 50: Dental services. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
3. Centers for Disease Control and Prevention (CDC). Recommended infection-control practices for dentistry, 1993. *MMWR* 1993;42(No. RR-8):1-12 Revised 2003.

## COMMENTS

1. Patients and dental healthcare workers (DHCWs) may be exposed to a variety of infectious, viral, and bacterial agents in dental care settings.
2. Routes of microbial transmission:
  - a. General Routes:
    - i. Direct contact with a lesion, organisms or potentially infectious secretions when performing intraoral procedures (e.g., practicing without wearing gloves).
    - ii. Indirect contact via contaminated instruments or disposable items (e.g., accidental percutaneous exposure from used needles).
    - iii. Airborne or droplet via aerosolization of microorganisms from patients' blood or saliva while using devices that can generate droplet spatter (e.g., air water devices, dental hand pieces).
  - b. DHCWs and patients as modes of transmission during patients care:
    - i. Patient to DHCW transmission of potentially infectious microbes can occur through breaks in the skin or through airborne exposure.
    - ii. DHCW to patient transmission of potentially infectious microbes can occur as a result of DHCW bleeding into a patient's mouth after sharps exposure or through respiratory droplets passed from DHCW to the patient.
    - iii. Patient to patient transmission can occur if instruments are improperly reprocessed or due to improper hand hygiene or improper glove wearing on the part of DHCWs.

## PROCEDURE

Treat every patient and instrument as potentially infectious with a life-threatening bloodborne pathogen.

**A. Hepatitis B vaccination**

All susceptible DHCWs should be vaccinated against hepatitis B. This vaccine is provided free of charge to at-risk employees by National Guard Health Affairs.

**B. Standard precautions** (refer to policy [ICM-II-03](#))

1. Practice standard precautions (hand hygiene and use of mask, gloves, goggles, face shield, gowns or aprons).
2. Dispose of sharps properly in puncture-proof containers; do not bend or recap (refer to policy [ICM-IX-02 Waste Management](#)).
3. Use paper with impervious backing, aluminum foil, or plastic covers to protect items and surfaces (e.g., light handles or X-ray unit heads) that may become contaminated by blood or saliva during use and that are impossible to clean and disinfect.
4. Remove these covers (while still gloved), discard them, and replace them (after ungloving and washing hands) with clean materials between patients.

**C. Pre-procedural mouth rinsing**

Patient should rinse with an antimicrobial mouth rinse before a dental procedure to reduce oral flora.

**D. Unit dose concept**

Preparing or dispensing a sufficient amount of material for a particular procedure before patient contact and discard any excess at completion. Single dose solutions or medications are recommended to prevent cross-contamination.

**E. Patient screening and evaluation**

Always obtain and determine the current health status of the patient, and always perform a thorough head, neck and oral examination to identify previously undiagnosed medical problems (examination may indicate a need for medical referral for the patient, e.g., for diagnosis of active tuberculosis).

**F. Management of needlestick injuries/blood and body fluid exposure**

Refer to policy [ICM-VII-04 Management of Occupational Exposures to HBV, HCV, and HIV](#).

**G. Work restriction for DHCWs**

Refer to policy [ICM-VI-04 Work Restrictions for Infected Healthcare Workers](#).

**H. Barrier techniques**

The use of barriers is important for reducing tissue contact with potentially infectious pathogens and materials, ultimately reducing cross-contamination and cross-infection between DHCWs and patients.

1. DHCWs must wear protective attire when performing treatment procedures capable of causing splashes, spatter, contact with body fluids, or contact with mucous membranes or when touching items or surfaces that maybe contaminated with these fluids.
2. The type of protection depends on the dental procedure.

**I. Instrument Reprocessing: Cleaning, Disinfection and Sterilization****1. General principles**

All dental and medical instruments can be classified into three categories: critical, semicritical or non-critical, depending on the potential risk for infection associated with their intended use and how they are reprocessed. Refer to Table 1.

2. Dental instruments
  - a. Wear heavy-duty (reusable utility) gloves when cleaning and reprocessing to lessen the risk of injury.
  - b. Clean the instruments thoroughly to remove debris prior to delivery to the Central Sterile Supply Department (CSSD) for disinfection and sterilization.
  - c. Place the instruments into a container of water or disinfectant/detergent as soon as possible after use to prevent organic material from drying on their surfaces, thus making cleaning easier.
3. Dental units and environmental surfaces can be divided into
  - a. Clinical surfaces
    - i. After treatment of each patient and at the completion of daily work activities, clean countertops and dental unit surfaces that may have become contaminated with patient material. Use paper towels, an appropriate cleaning agent, and water for cleaning.
    - ii. After cleaning an environmental surface contaminated with patient material, disinfect it with a chemical germicide registered with the U.S. EPA as a “hospital disinfectant” and labeled “tuberculocidal.” Examples of such intermediate-level disinfectants include phenolics, iodophors, and chlorine-containing compounds such as diluted household bleach (sodium hypochlorite). The manufacturer’s recommended contact time (kill time) should be used.
    - iii. To prepare a fresh solution of a 1:100 dilution of sodium hypochlorite as an inexpensive intermediate-level disinfectant, add ¼ cup of household bleach to 1 gallon of tap water. **This solution is active for only 24 hours and must be prepared fresh each day.** Caution should be exercised because chlorine solutions can corrode metals such as aluminum.
  - b. Housekeeping surfaces  
Clean floors, walls, and other housekeeping surfaces a hospital-approved low-level disinfectant such as a quaternary ammonium compound.
4. Dental laboratory
  - a. Clean and disinfect laboratory materials and other items that have been used in the mouth (e.g., impressions, bite registrations, fixed and removable prostheses, and orthodontic appliances) before manipulating them in the laboratory. After manipulation, clean and disinfect these items again before placing them in the patient’s mouth.
  - b. Use a intermediate-level disinfectant with an EPA-registered “hospital disinfectant” that is labeled “tuberculocidal” to disinfect laboratory materials.

**J. Use and care of handpieces, antiretraction valves, and other intraoral dental devices attached to air and water lines**

1. Heat-sterilize all high-speed dental handpieces, low-speed handpiece components used intraorally, and reusable prophylaxis angles. Acceptable methods of sterilization include steam under pressure (autoclaving), dry heat, or heat/chemical vapor. It is NOT acceptable to reprocess high-speed dental handpieces, low-speed handpiece components used intraorally, and reusable prophylaxis angles by wiping or soaking these instruments in liquid chemical germicides.
2. Follow the manufacturer’s instructions for cleaning, lubrication, and sterilization of handpieces and reusable prophylaxis angles to ensure effective sterilization and longevity of the instruments.
3. Install antiretraction valves (one-way flow check valves) in dental unit water lines to prevent fluid aspiration and to reduce the risk of the transfer of potentially infectious material. Ensure routine maintenance of antiretraction valves.
4. Run high-speed handpieces to discharge water and air for a minimum of 20 to 30 seconds after use on each patient. If possible, use an enclosed container or high-

- velocity evacuation during discharge procedures to minimize the spread of spray, spatter, and aerosols.
5. At the beginning of each clinic day, remove handpieces and allow water lines to run and discharge water for several minutes to reduce overnight microbial accumulation.
  6. Use sterile water or saline as a coolant/irrigator when surgical procedures involve cutting bone.
  7. After treatment of each patient, clean and sterilize reusable intraoral instruments attached to, but removable from, the dental unit air or water lines (e.g., ultrasonic scaler tips and their component parts and air/water syringe tips) in the same manner as handpieces. Follow the manufacturer's instructions for reprocessing.
  8. Some dental instruments have components that are heat sensitive or are permanently attached to dental unit water lines. Other instruments (e.g., handles or dental unit attachments of saliva ejectors, high-speed air evacuators, and air/water syringes) that do not enter the patient's mouth can become contaminated with oral fluids during treatment procedures. Cover these instruments with impervious barriers that are changed after each use or, if possible, clean and then disinfect them with an EPA-registered "hospital disinfectant" that is labeled "tuberculocidal".
  9. Flush all water lines to all instruments thoroughly after the treatment of each patient and at the beginning of each clinic day.
  10. Advise patients **not** to close their lips tightly around the tip of the saliva ejector to filter oral fluids.

#### **K. Water quality**

Use water that meets the EPA regulatory standards for drinking water (i.e., <200 CFU/mL of heterotrophic water bacteria) for routine dental treatment output water. Schedule water sampling must be done to monitor water quality.

#### **L. Single-use disposable instruments**

Use single-use disposable instruments (e.g., prophylaxis angles, prophylaxis cups and brushes, tips for high-speed air evacuators, saliva ejectors, and air/water syringes) for one patient only and discard after use.

#### **M. Handling of biopsy specimens**

1. Place each biopsy specimen in a sturdy container with a secure lid to prevent leaking during transport.
2. Avoid contaminating the outside of the specimen container. If the outside is visibly contaminated, clean and disinfect it or place it in an impervious bag.

#### **N. Disposal of infectious waste materials**

1. Pour blood, suctioned fluids, or other liquid waste into a drain connected to a sanitary sewer system.
2. Place solid waste contaminated with blood or other body fluids in sealed, sturdy impervious bags that are leak proof; refer to policy [ICM-IX-02 Waste Management](#).

#### **O. Practices for the dental laboratory**

1. Separate the receiving area from the production area. Clean and disinfect countertops and work surfaces daily.
2. Disinfect all incoming cases as they are received. Sterilize or disinfect containers after each use. Discard packing materials to avoid cross-contamination.
3. Production area:

- a. Wear a clean uniform or laboratory coat, a face mask, protective eyewear, and disposable gloves.
  - b. Clean debris from work surfaces and equipment and disinfect them daily.
  - c. Separate instruments, attachments, and materials to be used with new prostheses/appliances from those to be used with prostheses/appliances that have already been inserted in the mouth.
  - d. Wash and autoclave rag wheels after each case.
  - e. Disinfect brushes and other equipment at least daily.
4. Disinfect each outgoing case before it is returned to the dental clinic.

**P. Dental radiography asepsis**

Wear gloves when taking radiographs and when handling contaminated film packets. Other PPE (e.g., mask, protective eyewear, protective clothing) is required when spatter or splashes of blood or other potentially infectious materials is anticipated.

**APPENDICES**

**Table 1:** Modified CDC/Spaulding Classification of Contaminated Patient Care Items and Environmental Surfaces

**Table 2:** Guide for the Selection of Appropriate Disinfection Methods for Items Transported to or from the Dental Laboratory

**Table 1-VIII-08**  
**Modified CDC/Spaulding Classification of Contaminated**  
**Patient Care Items and Environmental Surfaces**

Classification	Description	Dental Clinic/Laboratory Examples	Relative Risk of Disease	Surface Recycling Processes
<b>Patient Care Items</b>				
Critical	Penetrates tissue; contacts open tissue	Cutting instruments; surgical burs, files, and needles; handpieces and scaler tips	High	Heat sterilization; sterile, single-use disposables.
Semi-critical	Contacts mucosa	Hand instruments (non cutting); mouth props; plastic prophylaxis angles; rubber dam frames	Intermediate	Heat sterilization; single-use disposables; chemical sterilization.
Non-critical (no intraoral contact)	Contacts unbroken skin	Blood pressure cuffs; radiograph head cone; pulse oximeters	Low	Clean with detergents (no blood or saliva); intermediate-level disinfection if visibly contaminated with blood; disposable barriers.
<b>Environmental Surfaces</b>				
Clinical contact	Usually contacts dental personnel, but not patients	Dental unit surfaces; laboratory equipment	Very low	Clean with detergent (no blood or saliva) and low-level disinfection (HIV/HBV label claim); intermediate-level disinfection if visibly contaminated with blood; disposable barriers.
Housekeeping	Rarely contacts dental personnel or patients	Floors; walls; countertops	Minimal	If no obvious blood, sanitize with detergent; intermediate-level disinfection if visibly contaminated with blood.

**Table 2-VIII-08**  
**Guide for the selection of appropriate disinfection methods for items**  
**transported to or from the Dental Laboratory**

Item	Method	Recommended Disinfectant(s)	Comments
<b>Appliances</b>	Immerse	Chlorine compounds or iodophors	Rinse thoroughly after disinfection.
Metal/acrylic		Glutaraldehydes	
All metal		Iodophors or phenolics	Facebow forks should be heat-sterilized before reuse.
<b>Articulators, facebows</b>	Spray, wipe, spray	Chlorine compounds or iodophors	Disinfectant can be prepared using slurry water (saturated calcium sulfate).
Cast	Spray until wet or immerse		Probably should not be disinfected until fully set (24 hours).
Custom impression trays (acrylic)	Immerse or spray until wet	Chlorine compounds, iodophors, or phenolics	Do not reuse, discard.
<b>Impressions</b>	Immersion disinfection preferred		Heat-sterilized reusable impression tray Discard plastic trays after use
Irreversible hydrocolloid (alginate)	Disinfect by immersion with caution. Use only disinfectants with short-term exposure times (no more than 10 min for alginates)	Chlorine compounds or iodophors	Short-term immersion in glutaraldehydes has been shown to be acceptable, but the immersion time is inadequate for disinfection.
Reversible hydrocolloid			Do not immerse in alkaline glutaraldehyde.
Polysulfide rubber Silicone rubber	Disinfect by immersion	Glutaraldehyde, chlorine compounds, iodophors, phenolics	Disinfectants requiring more than 30-min exposures are not recommended.
Polyether	Disinfect by immersion with caution. Use only disinfectants with short-term exposure times (no more than 10 min)	Chlorine compounds or iodophors	ADA recommends any of the disinfectant classes; however, short-term exposures are essential to avoid distortion.
ZOE impression paste	Disinfection by immersion is preferred. Spraying can be used for bite registrations	Glutaraldehyde or iodophors	Not compatible with chlorine compounds. Phenolic sprays can be used.
Impression compound		Iodophors or chlorine compounds	Phenolic sprays can be used.
<b>Prostheses</b>	Immerse in disinfectant. Use caution to avoid corrosion of metal. Can also be sterilized by exposure to ethylene oxide gas	Rinse thoroughly after disinfection	Clean "old" prostheses by scrubbing with handwash antiseptic or sonification before disinfection.
Removable (acrylic/porcelain)		Chlorine compounds or iodophors	Rinse thoroughly after disinfection; store in diluted mouthwash.
Removable (metal/acrylic)		Chlorine compounds or iodophors	
Fixed (metal/acrylic)		Glutaraldehydes, chlorine compounds or iodophors	Rinse thoroughly after disinfection.
<b>Shade guides</b>	Immerse or spray, wipe, spray	Iodophors or phenolics	Final wipe with water or alcohol to avoid discoloration.
<b>Wax rims, wax bites</b>	Rinse, spray, wipe spray	Iodophors or phenolics	Rinse again after disinfection.

TITLE/DESCRIPTION: <b>BURN UNIT</b>		INDEX NUMBER: <b>ICM – VIII-09</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide infection control guidelines on the practices required to prevent infection and sepsis in burn patients.

## REFERENCE

Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 43: Burns. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)

## COMMENTS

1. Burn patients have a higher incidence of sepsis compared to patients with other forms of trauma because of extensive skin barrier disruption and an alternation in the cellular and humoral immune responses.
2. The dysfunction of the immune system, a large cutaneous bacterial load, the possibility of gastrointestinal bacterial translocation, prolonged hospitalization and invasive diagnostic and therapeutic procedures all contribute to sepsis. Therefore, infections in burn patients are a leading cause of morbidity and mortality.
3. Reservoirs of microorganisms that cause infections in burn patients include the surfaces of burn wounds on all burn patients, the hands of healthcare workers (HCWs), inanimate environmental objects (hydrotherapy equipment and associated plumbing, cooling blankets, mattresses, etc.), raw fruits and vegetables, and the colonic flora of the patients themselves.
4. The mode of transmission is primarily direct or indirect contact.

## PROCEDURE

### A. Healthcare workers

1. Perform strict hand hygiene (“5 moments”). Refer to policy [ICM-II-04 Hand Hygiene](#).
2. Strictly follow standard precautions to minimize or prevent exposure to bloodborne and other microorganisms when caring for all patients. Refer to policy [ICM-II-03 Standard Precautions](#).
3. Wear personal protective equipment (PPE) to prevent the transmission of infection during patient care.
  - a. Aprons or gowns should be donned before each patient contact and discarded immediately after completing the task at hand.
  - b. Change gloves when soiled and before continuing with care at another site on the same patient.
4. Practice aseptic technique for all patient care procedures requiring asepsis (e.g., catheter insertion and dressings).
5. Initiate isolation precautions for patients infected or colonized with multidrug-resistant organisms. Notify the Infection Control Practitioner.

6. Patients with larger burns (>25% total body surface area (TBSA)) can be placed in a single room as an additional precaution.
7. Comply with Employee Health (EH) guidelines. Report to EH for any of the following:
  - a. Any suspected infections.
  - b. Exposure to any communicable disease.
  - c. Any significant exposure to body fluids through sharps injuries, splashes, and/or non-intact skin contact.

#### **B. Patient**

1. Use topical antimicrobial agents such as silver nitrate, mafenide acetate, and silver sulfadiazine on burn wounds to reduce the multiplication of microorganisms on the wound surface.
2. To prevent infection transmission, hydrotherapy equipment must be cleaned and disinfected between patients and at the end of the day using a hospital-approved disinfectant per the manufacturer's instructions.
3. Restrict plants and flowers at the bedside of patients because they harbor gram-negative organisms such as *Pseudomonas* spp. as well as fungi.
4. For pediatric patients, in addition to the recommendations mentioned above, restrict non-washable toys (stuffed animals, cloth objects, etc.).

#### **C. Sitters/Visitors**

1. Sitters/visitors must adhere to the burn unit personnel's recommendations/instructions regarding infection prevention requirements (e.g., visiting other patients, PPE use, hand hygiene).
2. Visitors must be excluded from the patient care area during wound care. If a visitor is needed during dressing (usually for small children), full protective equipment must be worn.
3. Instruct patients/sitters/families regarding the instructions pertaining to the infection prevention measures.

#### **D. Housekeeping**

1. Housekeeping practices should be stringently monitored by the unit Charge Nurse to ensure maximum cleaning of common nosocomial reservoirs, such as mattresses, hydrotherapy equipment, soap dispensers, sinks and floors.
2. Only disinfectants that are approved by the hospital should be used.
3. There must be designated cleaning equipment (e.g., mops, pails, and a wet vacuum) for use in the unit.
4. Housekeeping personnel should receive training on the special needs for environmental sanitation in the unit.

#### **E. Equipment and devices**

1. Send all reusable semi-critical and critical items to the Central Sterilization and Supply Department for reprocessing (cleaning, disinfecting and sterilizing).
2. All other patient care equipment must be cleaned with hospital-approved disinfectant when visibly soiled, between patients, daily, and upon patient discharge. A cleaning schedule should be used to monitor equipment cleaning.

**F. Medical Waste Management:**

Medical waste is waste that is potentially infectious to healthcare workers, housekeepers and the public and must be placed in a yellow bag. Refer to policy [ICM-IX-02](#), *Waste Management*.

1. Any vessel, bag, or tubing that contains more than 20 ml blood/blood product.
2. Bandages and dressings soaked with more than 20 ml blood/blood product.

**G. Operating Room**

Refer to your institutional policy in the Operating Room for guidelines regarding proper surgical attire, traffic control and reprocessing of contaminated instruments, among other guidelines.

TITLE/DESCRIPTION: <b>MORTUARY CARE</b>		INDEX NUMBER: <b>ICM – VIII-10</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide clear infection control standards and guidelines on the appropriate care of the body following death to protect healthcare (HCWs), morgue staff and families from potential infectious exposures.

## REFERENCES

Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 108: Postmortem care. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)

## COMMENTS

1. Preparing the deceased for the morgue always involves the handling of blood, body fluids, and biological agents and may also involve exposure to life-threatening biologicals, chemicals, radiation, or electrical current.
2. Refer to hospital policies on safe management of dead bodies and body parts.

## PROCEDURE

### A. Nurses

1. Adhere to standard precautions and use appropriate personal protective equipment (PPE) at all times.
2. After the physician declares death, perform the following tasks to prevent exposure to blood and body fluid during transportation to protecting morgue personnel:
  - a. Remove all disposable tubes and lines appropriately.
  - b. Dress all wounds with impervious material to prevent oozing of body fluids or bleeding from wounds or previous catheter sites.
  - c. Request an appropriately sized body bag and place the body in the bag.
3. Follow the proper identification of the body, transportation, and documentation in the morgue.
4. Patients with known infectious diseases should have body tags labeled with the appropriate category (see [Appendix A](#)).
5. The nurse in charge or dedicated personnel will inform the morgue supervisor if the deceased was known to harbor an infectious agent. (This information will also be confirmed in writing on the identification tag.)
6. Body parts (including placentas, stillborns, products of miscarriage, etc.) must be put in a red bag, clearly labeled, and stored in the refrigerator until delivery to the morgue.

**B. Morgue Staff**

1. All morgue staff and especially body washers must be oriented and attend in-service training annually regarding the proper infection control practices (i.e., hand hygiene, modes of disease transmission, and the importance of PPE) and how to apply these practices.
2. Always use standard precautions and use appropriate personal protective equipment (PPE) at all times. Refer to policy [ICM-II-03 Standard Precautions](#).
  - a. Avoid direct contact with blood and body fluids.
3. Use PPE (mask, goggles, latex/vinyl gloves, boots, waterproof full-length apron) to prevent splashing and contamination with body fluids.
  - a. Remove disposable PPE and discard immediately after the task is completed.
  - b. Reusable aprons and boots must be cleaned between patients and at the end of each shift.
4. Put contaminated linen in a laundry bag and send to the laundry.
5. Ensure that the body bags (which are plastic) are appropriately disposed of when the body is removed (in a yellow bag).
6. Do not drink or eat inside the morgue.

**C. Needle stick or body fluid exposure**

1. All morgue staff should be evaluated in the Employee Health Clinic on a yearly basis for regular checkups and at any other time as deemed necessary (such as after an exposure to body fluid or blood; refer to policy [ICM-VI-02 Pre-Employment Assessment and ICM-VI-03 Immunization Guidelines for Healthcare Workers](#)).
2. Ensure that the death log book is available in the morgue.

**D. Morgue Facility and Maintenance**

1. Keep the morgue clean.
2. Monitor the temperature of the refrigerators (4°C) and record the temperature on the temperature chart on a daily basis.
  - a. Any temperature failure (temperature out of range) must be reported to the Utilities and Maintenance (U&M) Department.
3. All equipment, table and counter surfaces, and transport trolleys must be cleaned after every patient and at the end of the day.
  - a. All tabletops, stretchers, and body boards must be made of washable material (plastic, vinyl, or stainless steel) to avoid water and body fluid contamination.
  - b. Use hospital-approved disinfectants.
4. All flammable chemicals and materials must be stored appropriately to avoid accidental exposure.

**Appendix A-VIII-10:  
Infectious Disease Category**

Categories	Diseases	Precautions	Bagging	Viewing	Washing in the hospital
I	All dead bodies not listed under category II.	Standard <sup>1</sup> Precautions	Yes	Allowed	Upon family request*
II	All dead bodies <u>with</u> anthrax, plague, rabies, smallpox, yellow fever, viral hepatitis B or C, HIV, SARS, avian influenza, viral hemorrhagic fever, Creutzfeldt-Jacob disease <u>with</u> necropsy, or another infectious disease as advised by the infectious diseases specialist or physician/infection control practitioner or microbiologist	Standard <sup>2</sup> Precautions	Yes	Not allowed	Required**

<sup>1</sup> Hand hygiene, gloves, surgical mask, water resistant gown, boots/shoe cover

<sup>2</sup> Hand hygiene, gloves, N95, water resistant gown, boots/shoe cover

\* Washing can be done outside of the hospital setting

\*\* No washing can be done outside of the hospital setting

TITLE/DESCRIPTION: <b>ANIMAL RESEARCH</b>		INDEX NUMBER: <b>ICM – VIII-11</b>
EFFECTIVE DATE: <b>01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To be implemented when using animals or animal tissues in biomedical research and/or teaching activities. To prevent exposure and transmission of pathogenic organisms that are naturally carried by animals or that have been introduced to the animals as part of the research or teaching.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 69: Animal research and diagnostics. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Guidelines for environmental infection control in healthcare facilities. (2003).
3. GCC unified regulations for management of hazardous materials. (2006).

## COMMENTS

1. The animal research facility must develop standard operating policies and procedures to include pathogen containment, decontamination, sterilization of equipment and instruments, employee training for laboratory safety, and specific procedures.
2. The animal research facility should establish a program for the proper veterinary care and treatment of animals used in research along with guidelines for the appropriate use of tranquilizers, analgesics, anesthetics, paralytics and euthanasia.
3. Work practices, PPE, and engineering control specific for each of the four animal biosafety levels (ABSL 1-4) have been published in the Biosafety in Microbiological and Biomedical Laboratories, fifth edition, 2007, U.S. Department of Health and Human Services (Chapter G).
4. Use disposable, single-use items whenever possible. A designated/segregated area within the animal research facility is required for reprocessing instruments and equipment used on animals or animal tissues. These instruments and equipment must never be introduced into the human patient supply system.
5. No items shall be used on both humans and animals.

## PROCEDURE

### A. Reprocessing reusable medical/surgical instruments and equipment

1. Each research facility should have policies and procedures on the reprocessing of medical/surgical instruments and equipment in place. These instruments must not be removed from the facility.
2. Refer to the International Association of Healthcare Central Service Material Management (IAHCSMM) and the Association for the Advancement of Medical Instrumentation (AAMI) for the development of standards for policies and procedures.
3. Single-use disposable instruments and equipment must be discarded appropriately immediately after use.

4. Reusable instruments and equipment must be received, cleaned, disinfected, and sterilized in the designated/segregated area within the animal research facility. Adequate storage is required.
5. **Instruments used on animals shall not be sent for disinfection and sterilization at any of the CSSD centers for patients.**

#### **B. Animal quality and infection risks**

1. Purpose-bred animals are bred specifically for use in research (rats, guinea pigs, hamsters, gerbils). Some species are rederived (delivered by cesarean section and raised in a disease-free environment to eliminate all naturally occurring pathogens), commonly rodents. Dogs and cats are rarely rederived because vaccination and strict isolation are used to eliminate naturally occurring pathogens.
2. Conventional animals are those that have varying and uncontrolled health backgrounds. They are generally healthy, and most are subject to measures to control the incidence of disease (e.g., vaccination, treatment of a specific disease).
3. Wild animals are acquired from their natural habitat (non-human primates, squirrels, groundhogs, marsupials). They pose the greatest risk to humans.
4. Some non-human primates are produced in domestic colonies; these animals are more like conventional animals.
5. Some dogs or cats are purpose bred or acquired from animal dealers or animal control facilities and shelters. These animals have been exposed to and may incubate diseases common to the species.
6. Conventional and wild animals pose the greatest risk to personnel working in animal research. All personnel should take the appropriate precautions.
7. Zoonoses are diseases transmitted from animals to humans (see Table 1). Zoonoses can be transmitted from animals to humans via bites, scratches, aerosols, ectoparasites, accidental ingestion, and contact with contaminated soil, food, and water.

#### **C. Activities performed by personnel engaged in animal and research activities that increase the risk of infection**

1. Husbandry procedures performed by support personnel include feeding, watering, removal of soiled bedding containing urine and feces, and sanitizing and disinfecting cages, equipments and facilities.
2. For research personnel and veterinary medical staff, procedures performed that increase risk include handling of restrained animals, injections, collection of blood, urine, feces and other body fluids, surgery, necropsy, pipetting, and preparing infectious agents and hazardous compounds.
3. Infection risks are associated with animal bites and scratches, lacerations, needle sticks, aerosol exposure to infected tissues during surgery and necropsy, splashes and mucosal exposure. Animals given radioactive chemicals or infectious agents also pose risks to staff.

#### **D. Infection prevention measures that reduce the risk of infection**

1. Animal facility:
  - a. The animal research unit should be engineered to provide adequate containment of animals and pathogens.
  - b. Daily decontamination and transport of equipment and waste, proper ventilation and air filtration to prevent recirculation of air in the unit to other areas of the facility should be completed.
  - c. Engineering control specific for the animal biosafety level in use must be strictly followed, including negative pressure in animal rooms relative to the corridor.

- d. Adequate security and containment, with no through traffic to other areas of the healthcare facility, should be maintained, and access should be restricted to animal care staff, researchers, environmental services, maintenance, and security personnel.
2. Animal Care:
    - a. All animals must be pathogen-free, healthy, and vaccinated as required.
    - b. Use specialized containment cage or facilities.
    - c. Quarantine incoming animals to detect incubating zoonotic pathogens.
    - d. Treat infected animals or remove them from the facility.
  3. Employee health and education:
    - a. Standard operating procedures must include:
      - i. Daily animal husbandry
      - ii. Pathogen containment and decontamination
      - iii. Sterilizing equipment and instruments
      - iv. Employee training for laboratory safety
      - v. Procedures specific to animal research site
    - b. Employees should be trained in the handling and restraint of animals as well as in the use of anesthetics and tranquilizers to manage wild animals and animals that resist handling.
    - c. Employees should be trained in using PPE (lab coats, surgical gowns, gloves, masks, eye protection), and hand hygiene. Personnel should not eat, drink, or apply cosmetics in animal rooms.
    - d. Implement an occupational health program for personnel working with animals to protect personnel from and to monitor exposure to hazards from animals such as zoonoses, animal bites, allergies, radiation, and toxic chemicals. This program should include the following:
      - i. Educational programs that provide staff with information about zoonoses, personal hygiene, animal bites, allergies, and precautions to be taken by pregnant women (occupational hazards).
      - ii. Immunization against selected diseases such as tetanus and pre-exposure immunization against rabies and hepatitis B virus.
      - iii. Regular screening for TB if nonhuman primates are used.
      - iv. Post-exposure prophylaxis and treatment involving zoonoses.

## **E. Waste management**

1. Waste segregation is necessary for various types of wastes generated from cadaver operations:
  - a. Black bags shall be used for general waste
  - b. Red bags shall be used for human parts
  - c. Yellow bags shall be used for infectious waste
2. Animal carcasses and animal tissues are to be collected in yellow bags and preserved isolated in a special fridge until they are treated and disposed of.

## **F. Facility design**

1. Rooms used for surgical procedures involving cadavers shall have negative pressure that would blow out the odor and smell, with a minimum of 15 air changes per hour, single-pass air, humidity between 30% and 60%, and temperature from 20-23 °C.
2. Rooms for surgical procedures involving cadavers shall have large sinks attached to proper sewer lines.
3. Sufficient freezers shall be provided to house dead bodies until used.
4. Walls shall be smooth, washable, and easily cleanable.
5. Ceiling shall be impervious, washable, and smooth structure.

6. Floor tiles shall be smooth, easily cleanable, and washable.
7. Floor drains shall be installed.
8. Environmental hazard signs and other identification signs shall be posted on the door and in applicable areas; such signs will include biohazard signs, flammable signs, and compressed gas cylinder signs.
9. Lockers or changing rooms shall be provided for the staff.
10. Only trained medical or paramedical teams shall handle or transport cadaver at any time.
11. Air curtains can be used in the entrances well as to the area.
12. Training rooms that are involved with cadaver anatomy must be cleaned by proficient housekeepers using approved disinfectant(s) (refer to cleaning policy).
13. All contaminated and medical items that require sterilization must be sterilized in coordination with CSSD in the animal research center.
14. All compressed gas cylinders must be dealt with as per APP number 837-07.

### G. Agents of zoonoses

1. Herpesvirus 1 (B virus: herpesvirus simiae)
  - a. B virus is the most significant infection health hazard in nonhuman primate research and is carried by Asian and African monkeys of the genus *Macaca*. The agent has been found principally in rhesus monkeys (*M. mulatta*).
  - b. Initially, infection in macaques is usually asymptomatic. Lesions may be found in the oral, ocular, and genital regions.
  - c. Transmission to humans occurs through exposure to contaminated animals (scratches, bites, splashes onto mucous membranes, and contact with animal tissues) or contaminated equipment (needlestick, sharp cage parts).
  - d. The incubation period from exposure to symptomatic disease ranges from days to five weeks.
  - e. Early symptoms include flu-like symptoms that may progress to encephalitis.
  - f. All macaque monkeys should be treated as though they are infected, and their body fluids and soiled cages should be handled as if they are contaminated.
2. Macaque monkeys should be used for research purposes only when clearly indicated and have a negative serology test twice, two months apart.
  - a. Access to areas where macaques are housed or used should be limited to those who are trained in the following:
    - i. Procedures to avoid the risk of infection, including protective clothing (long-sleeved gowns or lab coats, eye goggles or face shields, surgical masks). Restraining or handling fully awake macaques is not recommended. Fully awake macaques should be handled only with arm-length leather gloves, and animals should be removed from their cages with the use of pole and collar restraints.
    - ii. Bites or scratches from macaques should be immediately and thoroughly scrubbed with antiseptic soap and water and reported to a supervisor and to employee health.
    - iii. Place a first-aid kit in the primate housing facility; employees working with macaques should receive training in first-aid procedures.
    - iv. Wounds sustained from working with monkeys or equipment contaminated with monkey saliva or wounds should be scrubbed vigorously for 15 minutes with gauze sponges soaked in antiseptic soap.
    - v. If eye splashes occur, rinse the eye immediately with water at an eye station or sink for 15 minutes.
    - vi. Post-exposure prophylaxis with valacyclovir (1 g p.o. every 98 hr for 3 weeks in adults or non-pregnant women) or acyclovir (800 mg five times a day for 21 days in pregnant women) should be instituted immediately and within 72 hours of exposure by the employee health clinic physician. Blood samples should be

drawn for detecting B virus, and wounds should be cultured for B virus. Staff should seek immediate medical attention for skin lesions, itching, or numbness around the wound. The wound should be examined every other day for the first week and then weekly through the end of the fourth week for vesicles, pain, numbness and itching. A second serum sample should be drawn in the 2<sup>nd</sup> to 3<sup>rd</sup> week.

- vii. The monkey associated with the human injury should be evaluated by a veterinarian for the presence of lesions and evaluated serologically for the presence of antibodies and viral cultures. The results should be reported to the treating physician and research staff.
- viii. Animals diagnosed as infected with B virus or seropositive for B virus should be killed and incinerated.

### 3. Hantavirus

- a. Hantavirus is associated with rodent hosts, including rats, mice and other wild animals.
- b. Hantavirus has not been reported in personnel working with commonly used laboratory rats (*Rattus norvegicus*) and mice (*Mus musculus*).
- c. The virus is shed in the saliva, urine, and feces of infected rodents.
- d. Transmission occurs through inhalation of infectious aerosols, wounds, contamination, conjunctival exposure and ingestion. The virus may be present in the blood and organs of infected mice. Rat cell lines have been demonstrated to be a source of infectious virus.
- e. Two syndromes have been associated with Hantavirus infections: hemorrhagic fever with renal syndrome and Hantavirus pulmonary syndrome.
- f. Potentially infected tissues samples should be handled in a BSL-2 facility in accordance with BSL-3 practices.
- g. Prevent exposure to rodents and their tissues by using proper PPE.

### 4. Lymphocytic choriomeningitis virus (LCMV)

- a. Wild mice are the principal reservoir of infection for LCMV.
- b. The virus is transmitted by direct skin or mucous membrane contact with infectious secretions (urine, feces, saliva) or by ingestion or inhalation of aerosolized virus particles from animal rooms or cages. Parenteral exposure can result from contact with contaminated bedding material. Tissue culture cell lines can become contaminated and harbor the virus.
- c. Infection causes aseptic meningitis in humans.
- d. Proper hygiene, hand washing, and gloves are important preventive measures.
- e. Animal biosafety level 3 (ABSL-3) practices are recommended for activities with high potential for the production of aerosols, manipulation of infectious materials or working with infected animals.

### 5. Rabies

- a. Rabies is caused by Rhabdovirus and can infect dogs, cats, parrots, and nonhuman primates. Verify that rabies vaccinations for dogs, cats, and nonhuman primates are up to date.
- b. Transmission is sustained by a bite from a rabid animal or inoculation of infectious saliva into the mucous membrane or a fresh wound.
- c. No cases of rabies have been reported in animal facility personnel; however, it is important to monitor for these zoonoses in facilities that use animals of unknown health background.
- d. Pre-exposure prophylaxis is recommended for personnel at high risk for potential exposure to rabid animals such as:
  - i. Veterinarians and veterinary technicians

- ii. Personnel handling high-risk animals (simians, animals in quarantine) or their tissues
    - e. Inactivated vaccine should be given IM (1 ml on days 0, 7, 21, and 28), with boosters for persons with continuous or frequent risk of infection (1 ml IM) based on antibody titer.
    - f. All bites from animals that can be infected with rabies virus carry a risk of rabies transmission.
    - g. Cases of rabies from presumed non-bite exposures are extremely rare, unless the exposure is to the person's mucous membranes or open wounds and the animal fluid/tissue making contact is potentially infectious (saliva, neural tissue); contact with blood, urine, or feces of a rabid animal does not constitute an exposure. Probable aerosol exposure to rabies virus in laboratories has resulted in two cases.
    - h. Dogs, cats, and parrots with up-to-date vaccinations are unlikely to become infected with rabies.
    - i. Suspected animals should be quarantined for 10 days after any bite injury or high-risk exposure.
    - j. Post-exposure prophylaxis includes:
      - i. Wound care through washing bite wounds and scratches with soap and water. Povidone iodine should also be used.
      - ii. Tetanus prophylaxis and antibiotics as indicated.
      - iii. Administration of rabies immunoglobulin (RIG) and rabies vaccine; refer to policy and algorithm [ICM-IV-07 Rabies Exposure Management](#).
6. Cat scratch fever
- a. *Bartonella henselae* is the etiologic agent of cat scratch fever. Cats and occasionally dogs are the reservoir of this agent.
  - b. Infection occurs following bites or scratches from healthy young cats and occasionally dogs, usually pet animals.
  - c. Personnel handling cats should use protective clothing to prevent bites and scratches. Wounds sustained should be thoroughly cleaned.
7. Q fever
- a. *Coxiella burnetii* is the etiologic agent of Q fever. Sheep, goats, and cattle are the most important reservoirs.
  - b. Transmission to humans follows exposure to fetal membranes, birth fluids and stillborn animals. Inhalation of infectious agents may occur during parturition.
  - c. To prevent exposure, obtain only male sheep or non-pregnant female sheep for experimental purposes. Employees should wear PPE (surgical masks, disposable gloves, shoe covers, gowns, or lab coats).
  - d. Ensure adequate ventilation in ruminant housing areas.
  - e. An N95 mask is recommended when working with animals during parturition and lactation or when performing surgery.
8. Tuberculosis
- a. Nonhuman primates are the animals most likely to be infected with mycobacteria, and transmission can occur between monkeys with a secondary spread to humans. Macaques are the most susceptible. Pulmonary disease is a common presentation among nonhuman primates.
  - b. Laboratory animals are routinely tested for tuberculosis upon arrival at the facility, every two weeks in quarantine, and quarterly in established colonies. The intradermal skin test (Mantoux) is used.
  - c. Animals suspected of having tuberculosis are generally euthanized.
  - d. Transmission of tuberculosis occurs primarily by infective aerosols. Individuals working with nonhuman primates have an increased risk for the development of a

positive tuberculin skin test. Personnel with tuberculosis pose a high risk for nonhuman primates.

- e. Personnel working with nonhuman primates should have a baseline tuberculin skin test and be tested annually if negative. Personnel with positive skin tests should be evaluated for active disease and reassigned to other work until active TB is ruled out. Only employees with positive skin tests should be evaluated by employee health for treatment.
- f. Staff working with nonhuman primates should receive training in PPE use and TB education.

#### 9. Other zoonoses

Laboratory personnel and animal care staff are exposed to other zoonotic infections such as campylobacteriosis, chlamydiosis, capnocytophagosis, pasteurellosis, shigellosis, leptospirosis, and rat bite fever. (Please refer to the Association for Professionals in Infection Control and Epidemiology, Animal Research and Diagnostics: Chapter 69.)

## Section 9: SUPPORT SERVICES

Section	Title	Page #
ICM - IX-01	<b>Sterile Supplies and Equipment Management</b>	247
ICM - IX-02	<b>Waste Management</b>	252
ICM - IX-03	<b>Single Use Devices (SUD)</b>	257



TITLE/DESCRIPTION: <b>STERILE SUPPLIES AND EQUIPMENT MANAGEMENT (PREPARATION, STORAGE AND SHELF LIFE)</b>		INDEX NUMBER: <b>ICM – IX-01</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines on the appropriate use of Central Sterile Supply Department (CSSD) services for the reprocessing of reusable items, proper storage, and event-related shelf life of all sterile items and equipment.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 21: Cleaning, disinfection, and sterilization. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Association for the Advancement of Medical Instrumentation. (2006). Comprehensive guide to steam sterilization and sterility assurance in healthcare facilities
3. CDC Hospital Infection Control Practices Advisory Committee (HICPAC). (2003). Guidelines for preventing healthcare associated pneumonia
4. Rutala WA and Webber DJ. (2008). Guidelines for disinfection and sterilization in healthcare facilities. *Healthcare Infection Control Practices Advisory Committee*.

## COMMENTS

The nature of disinfection and sterilization can be understood if instruments and items for patient care are divided into three categories according to the degree of risk of infection involved in their use.

Patient care items (equipment, surgical or medical devices) are classified into three categories. They are as follows:

### A. Critical items

1. This category includes objects and items entering the vascular system and sterile tissue.
2. Examples of critical items are surgical and dental instruments, cardiac and blood catheters, implants and needles, blood compartments of hemodialysis equipment, laparoscopes, arthroscopes, and other scopes that are introduced into sterile tissues.
3. These items present a high risk of infection and require sterilization after each patient use.
4. All reusable items in this category must be processed by the CSSD.

### B. Semi-critical items

1. This category includes objects and items that come in contact with intact mucous membranes and non-intact skin but do not penetrate body tissues or the vascular system.
2. Examples of semi-critical items are non-invasive medical equipment, flexible and rigid fiberoptic endoscopes, respiratory therapy and anesthesia equipment, endotracheal tubes, and cystoscopes.
3. These items may require either medium or high level disinfection after each patient use.
4. Any reusable items in this category must be processed by CSSD.

### C. Non-critical items

1. This category includes items and objects that come in contact with intact skin only.
2. Examples of non-critical items are bedpans, blood pressure cuffs, tourniquet cuffs, and crutches.
3. These items could potentially contribute to secondary transmission of microorganisms to healthcare workers' hands; therefore, they require cleaning with hospital-approved disinfectant at the point of use.
4. These items do not require CSSD service.

## PROCEDURE

### A. General guidelines

1. Observe standard precautions when handling contaminated items and instruments.
2. Disposable single-patient items must be discarded by the end user at the point of use.
3. Used disposable single-use items will not be reprocessed. Refer to policy [ICM-IX-03 Single Use Devices](#).
4. Used single patient use devices (e.g., breast pumps) will not be processed by CSSD. Consult IP&C with the product and manufacturer's instructions.
5. Reusable items and instruments are reprocessed by CSSD, where the manufacturer's information for use (IFU) and instructions for reprocessing are strictly followed.
  - a. Instruments for reprocessing must be sprayed with a hospital approved transport medium available immediately after use in designated area.
  - b. Items must then be contained in a covered receptacle in the soiled utility room.
  - c. Items must be transported to CSSD in an appropriately covered secured container.
  - d. The end user is responsible to provide the most recent IFU and Instruction Transfer form to CSSD (attached).
  - e. All new items received must be transferred to the main CSSD office with the original packaging, product insert and the completed Information Transfer form.

### B. Storage of sterile supplies

Sterile supplies must be stored to ensure that sterility is not compromised

1. Maintain a clean and dry storage area. Open shelving may be utilized if the storage area has limited access and monitored ventilation and the area is frequently cleaned. Covered or closed shelving is preferred.
2. Storage shelves or cabinets must be 18 inches from the ceiling, 8 to 10 inches from the floor, and 2 inches from the outside wall. They must be away from sprinklers and air vents, and temperature and humidity must be controlled.
3. Do not store sterile packs under sinks, exposed pipes, floors, or window sills.
4. Minimize the handling of sterile items to reduce and prevent the risk of packages from being crushed, bent, compressed or punctured.
5. All supplies sterilized in house should have a sterilization date affixed to each package when issued.
6. Rotate sterile supplies on a first-in-first-out basis so as to avoid the use of expired items.
7. Store items with the longest sterilization date at the back of the shelf and the first items to expire at the front of the shelf.
8. On a regularly scheduled basis, inspect all sterile items for package integrity and/or expiration dates to avoid using contaminated or outdated supplies.
9. The use of items beyond the expiration date should be in consultation with CSSD and/or Infection Control referrals.

**C. Shelf life of patient care items and supplies sterilized by CSSD**

The shelf life for all items processed in CSSD is 'event-related' and are issued with a sterilization date.

1. The event-related refers to the sterility based on the handling, storage, and packaging degradation. The items or supplies are considered sterile only if the follow is met
  - a. No tears, compressions, abrasions, punctures, moisture, dirt, bending, or damage in any way.
  - b. The package must be able to be opened without contaminating the contents.
2. Any package that is not intact (i.e., with compromised integrity) may be contaminated and must not be used. These items must be returned in their original packaging to CSSD office for reprocessing.
  - a. Do not use items from packages that are damaged (torn, damp, soiled or dusty) or have been opened and resealed.
  - b. Do not use items from packages that were opened (not used or items removed) and resealed.
3. The integrity of sterile packs must be inspected regularly.
4. Sterile packages processed by CSSD that are not used within 4 years (or as recommended by the hospital) must be returned to CSSD for re-sterilization or removal as a stock item. Notification from CSSD via Event Related Sterility form approximately every 4 years.
5. Refer to hospital's CSSD policy.

**D. Shelf life and expiration date for commercial sterile patient care items and supplies**

1. The event-related expiration date refers to the integrity of the package:
2. If the packaged item does not have an expiration date and
  - a. Does not contain fluids, antimicrobial agents, special coating or other materials, medication, or movable tips/parts that are subject to deterioration or degradation over time, which reducing the effectiveness or quality of the product, the event-related expiration date applies.
  - b. The items or supplies are considered sterile only as long as there are:
    - i. No tears, compressions, abrasions, punctures, moisture, bending, or damage in any way.
    - ii. The package must be able to be opened without contaminating the contents.
3. If the item has an expiration date and it contains fluids, antimicrobial agents, special coating, or other materials that are subject to deterioration or degradation over time, thereby reducing the effectiveness or quality of the product, the item must be discarded safely by the manufacturer's expiration date.
4. Any package that is not intact (i.e., with compromised integrity) may be contaminated and must not be used. These items must be returned in their packaging to CSSD for immediate reprocessing.
  - a. Do not use items from packages that are damaged (torn, damp, soiled or dusty) or have been opened and resealed.
5. The integrity of sterile packs must be inspected regularly.
6. Store items with the longest sterilization date at the back of the shelf and the first items to expire at the front of the shelf.
7. All departments must have a written policy that outlines the procedure for the safe disposal of expired supplies and equipment.
8. The Infection Prevention and Control Department must be contacted and informed in the event that an expired patient care item described above is being considered for use.



**OR to CSSD "Instructions Transfer" Template**

**Ref.#:**

**Date:** \_\_\_\_\_

- \* all 3 parts- first time received
- \* 2nd & 3rd parts-manuf. changes & end user info
- \* 3rd part - end user info only
- \* email to CSSD- use one click e/m button only!
- \* 3rd part - end user info only
- \* email to CSSD- use one click e/m button only!

**TO: Dawn Winger**  
Supervisor, CSSD Nursing Services

**FROM:** \_\_\_\_\_  
\_\_\_\_\_

**Name of Device :** \_\_\_\_\_

**Manufacturer:** \_\_\_\_\_

S.U.D.       Item       **System** → # trays

**I am transferring:**

**Part 1**  **Information For Use- IFU** (formerly known as "Manufacturer's Instructions"):

- information for use re: care, cleaning & sterilization(document must relate on paper to the item)
- IFU Date: \_\_\_\_\_
- relevant catalogue for the above mentioned item(s)
- original product insert from the original packaging & packaging itself
- via:  **CSSD SPT1pgr 5936.** \_\_\_\_\_ CSSD will pick up (MOR only), with vendor still available!  
(verifies vendor inventory w/ vendor checklist, reviews UFI provided, identifies issues at the time with end user and vendor- provides status if required)
- Other: (Palace use only) \_\_\_\_\_

**Part 2**  **Vendor Details:** (photocopy or attach business card here)

- Name \_\_\_\_\_
- Company \_\_\_\_\_
- E/mail \_\_\_\_\_
- Cell \_\_\_\_\_
- Office \_\_\_\_\_

**Part 3**  **End User Info:**

- Contact details : Name: \_\_\_\_\_ Ext. \_\_\_\_\_ Pgr. \_\_\_\_\_
- Service : \_\_\_\_\_
- Owned :
- Loaner :  J.I.T.  Long Term
- Demo :  for demo only

**Current location of item:** \_\_\_\_\_

**DATE required:** \_\_\_\_\_ **TIME required:** \_\_\_\_\_

Thank you  Leong  Raffy

**CSSD office use only**

1	<input type="checkbox"/>	Pick up Point	8	<input type="checkbox"/>	Vendor inservice
a	<input type="checkbox"/>	verify actual instr. w/vendor list	9	<input type="checkbox"/>	CRN inservice
b	<input type="checkbox"/>	review UFI	10	<input type="checkbox"/>	Instr. to _____ for processing
c	<input type="checkbox"/>	initiates feedback end user/vendor.	11	<input type="checkbox"/>	Info scanned onto computer
d	<input type="checkbox"/>	trays appropriate?	12	<input type="checkbox"/>	Computer named & filed
2	<input type="checkbox"/>	AA3 notified/Log#] _____	13	<input type="checkbox"/>	SPT to link Q.R. to the scanned IFU.
3	<input type="checkbox"/>	CRN notified	14	<input type="checkbox"/>	Hard copy filed [memo & attachments from vendor & original IFU]
4	<input type="checkbox"/>	SPT notified	15	<input type="checkbox"/>	Comments: _____
5	<input type="checkbox"/>	SPT completes checklist-[refer to vendors's initial list]			
6	<input type="checkbox"/>	Quick reference complete			
7	<input type="checkbox"/>	CRN reviews checklist, instr.			

**"Sterility is Event Related" dependent upon:**

1. appropriate & effective handling and storage [*end user responsibility*] and
2. packaging degradation [*CSSD responsibility- every 4 years even if the packaging is intact*]

CSSD reprocesses items stored sterile but not utilized in 4 years, based on Event Related Sterility (ERS) guidelines.

All end users must use the form provided to log your items returned to CSSD this week for reprocessing.

*re: OR areas only, the tray inventory provided will be utilized for this purpose. Peel items will need to be listed by hand on the form provided.*

- 1 All items must be returned to the CSSD office in the original packaging.
  - \* Do **NOT** open the item at source.
  - \* Do not return to CSSD via the main CSSD decon. window.
- 2 All items requiring reprocessing will be returned to you within 2- 3 days.
  - \* Please remember you have not used them in 4 years.
  - \* Please reconsider the need to have this item sterile on the shelf since it has not been used in 4 years?
- 3 Should there be any items no longer required to be kept sterile on your units, CSSD will require an e-mail from the Nurse Manager asking CSSD to remove them from circulation.
- 4 Should the packaging integrity be compromised in any way it must be returned to CSSD for reprocessing at the time.
  - \* This would include the item being bent, crushed, torn, stained, wet, having a visible foot print on it, abraded, resealed with scotch tape etc.
  - \* When in doubt page the CSSD CRN 3320 for point of use consultation.  
*Do not open it until we arrive!*
- 5 When this annual process has been completed, it is the end user responsibility to notify the CSSD via e-mail that the process is complete.
  - \* This includes units who do not require inventory reprocessing for that year.

TITLE/DESCRIPTION: <b>WASTE MANAGEMENT</b>		INDEX NUMBER: <b>ICM – IX-02</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To define the method for handling, transporting, and disposing of infectious waste to ensure cost reduction and the safety of HCWs, sanitation workers, and the general public.

## REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 60: Laboratory safety. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 100: Environmental services. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
3. Hospital's administrative policy on management of spills of hazardous material.

## COMMENTS

1. Infectious waste (also called medical, biomedical, regulated or biohazard waste) is defined as materials generated as a result of the diagnosis or treatment of a patient and that is capable of producing an infectious disease.
2. The risk of acquiring an infection from medical waste is extremely remote. No waste disposal worker or member of the general public has ever acquired an infection from medical waste.
3. In general, the microbial load of hospital waste is less than that of residential waste.
4. Careless designation and disposal of all hospital waste as "infectious waste" by HCWs leads to unnecessary consumption of hospital resources to manage such waste.
5. Infectious waste has been specifically defined by regulatory authorities such as the Centers for Disease Control (CDC) and the Environmental Protection Agency (EPA). For any infectious waste to be capable of causing infection, a susceptible host must be exposed to a pathogen in the waste and must have a portal of entry, and the pathogen must be of sufficient virulence and quantity.
6. General hospital waste is categorized as items not soaked in blood or body fluids.
7. Infectious waste is categorized as:
  - a. Blood and blood products: any liquid or semi-liquid blood or other potentially infectious materials including serum and plasma.
  - b. Pathology waste: includes human or animal tissues such as placenta, uterus, organs, and body parts that are collected at autopsy or during surgery.
  - c. Microbiological cultures and stocks and microbiological waste: items containing blood or other potentially infectious materials as well as discarded live and attenuated vaccines.
  - d. Sharps: include needles, scalpels, blades, glass, and pipettes.
  - e. Contaminated items: items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling.
  - f. Contaminated animal carcasses, body parts, and bedding.

7. Isolation and operating rooms: waste is considered general hospital waste unless it meets the criteria of infectious waste.
8. Waste containers
  - a. Sharps containers must be rigid, puncture-proof, leak-proof and closable.
  - b. Plastic bags should be puncture or tear-resistant.
  - c. All designated infectious waste containers should have a biohazard label or be color-coded (i.e., yellow bags), rendering them identifiable by hospital staff.
9. Storage
  - a. Dispose of and treat infectious waste as soon as possible after generation.
  - b. Minimize the storage time to reduce the risk of potential exposure and reduce odor.
  - c. Limit access to storage areas and have a biohazard symbol posted such that it is readily visible to anyone.

## RESPONSIBILITY

1. Hospital department responsible for waste collection and disposal.
2. The Department of Infection Prevention & Control will assist with staff education and the hospital's auditing office will monitor and give feedback.

## PROCEDURE

### A. Three methods of waste segregation must be followed at the point of generation (i.e., by the end user).

1. **BLACK** bags
  - a. Used to dispose of general hospital waste.
  - b. Items that would **not** release (drip) blood or other potentially infectious materials in a liquid or semi-liquid state if squeezed.
  - c. Place solid waste not grossly contaminated with potentially infectious blood or body fluids from isolation rooms or operating rooms in black bags.
  - d. Laboratory solid waste, not included in the infectious waste category.
2. **YELLOW** bags
  - a. Used to dispose of infectious waste.
  - b. Containers with blood/body fluids that cannot be emptied.
  - c. All microbiological waste (specimens, cultures, and stocks of etiologic agents).
  - d. Items moderately or heavily soaked (dripping) in blood or body fluids.
  - e. Chemotherapy waste.
  - f. Place infectious waste in the appropriate designated container, lined with yellow disposal bags.
  - g. One garbage bin lined with a yellow disposal bag can be kept in the dirty utility room of non-ICU units or areas.
3. SHARPS containers
  - a. Used to dispose all needles, scalpels, pipettes, syringes, and glass items.
  - b. Do not disassemble blades or needles from equipment.
  - c. Discard sharps so that they do not protrude from the opening of the container.
  - d. Replace the sharps container promptly when the sharps container is  $\frac{3}{4}$  filled (and reaches the fill line) (Housekeeping Services).
4. **RED** bags
  - a. Use to transport body parts, organs, or fetuses for burial.

**B. Healthcare workers**

1. Discard all waste generated in your area into the appropriate bin.
2. Wearing the appropriate protective apparel, carefully pour potentially infectious liquid waste down the drain.
3. Care should be given not to generate splashes that may contaminate yourself and the surrounding environment.
4. Hand hygiene sinks should not be used to dispose of such fluids.
5. Place empty bulk blood and blood product containers in black bags.
6. Perform hand hygiene immediately after body fluid exposure.

**C. Environmental services (Housekeeping services)**

1. Pick up waste at least once per day and as needed.
2. Handle bags at the top so that the bags do not come in contact with your body. Do not use your hands to compress (squeeze) waste in containers/bags.
3. Tie bags securely before placing them in a temporary holding area such as a dirty utility room. Do not store waste bags in hallways or corridors.
4. Replace the sharps container promptly when it is  $\frac{3}{4}$  full or reaches the fill line.
5. Fasten the cover of a full sharps container securely before removing.
6. Decontaminate disposal bins/containers or frames when visibly soiled. These items should be cleaned weekly with hospital-approved disinfectant.
7. Decontaminate carts used for transporting waste within the hospital daily using a hospital-approved disinfectant solution.
8. Use leak-proof carts that are readily cleanable to transport infectious waste from the point of generation or storage to the point of disposal and treatment.
9. Place yellow bags in a holding area for incineration.
10. Pick up and discard broken glass using a mechanical device such as forceps or a brush and dust pan. Broken glass should never be handled with gloved or non-gloved hands.
11. Clean blood spills according to a written procedure (see “Blood Spills Cleaning” below).

**D. Blood Spills**

All work locations where employees may come into contact with blood or other potentially infectious material must have equipment/kits available to safely and effectively clean up any spills. This kit must include the following:

1. Personal protective equipment (PPE): gown, gloves, eyewear, mask, forceps, plastic scoop, absorbent material, and yellow bags.
2. Sharps container and approved hospital disinfectant (bleach).

**PROCEDURE**

The steps described below should be taken when cleaning and decontaminating spills of blood or other potentially infectious materials:

When an infectious/medical waste spill has been identified, perform the following steps:

1. Control access to area
  2. Contain the spill with paper towels or other absorbent materials
  3. Contact housekeeping to disinfect the area
1. Control access to area: Prevent people from walking through affected area and spreading the blood or other potentially infectious material to other areas.
    - a. Put on appropriate PPE

- b. Use forceps, a plastic scoop, or other mechanical means to remove any broken glass or other sharp objects from the spill area.
  - i. Never pick up sharps with your hands.
  - ii. Take care not to create aerosols.
  - iii. Place sharp objects carefully in sharps container.
2. Contain spill: Use paper towels or other absorbent materials to contain the spill.
  - a. Apply the appropriate disinfectant. To avoid creating aerosols, never spray disinfectant directly onto the spilled material. Instead, gently pour disinfectant on top of paper towels covering the spill or gently flood the affected area, first around the perimeter of the spill, then working slowly toward the spilled material. *If sodium hypochlorite solution (5.25% household chlorine bleach) is used, prepare a fresh solution on a daily basis.*
    - i. Leave for the recommended contact time.
  - b. Pick up all absorbent material and carefully place in a yellow bag for disposal. Remove PPE and place in a yellow bag for disposal.
  - c. Seal the yellow bag.
  - d. Wash hands thoroughly with soap and water.
3. Contact housekeeping to clean the affected area with hospital-approved disinfectant.

#### E. SPILLS occurring within the biosafety cabinet

When infectious material is spilled within the biosafety cabinet, it should be cleaned up immediately by the individual performing the work. If the cabinet is certified and working properly and not overfilled with lab equipment, which limits the cabinet's air flow, there is little risk of aerosolization of the material into the general laboratory environment.

Additionally, employees working with potentially infectious microorganisms must wear adequate personal protective equipment (PPE).

When cleaning and decontaminating a spill within a biosafety cabinet, care should be taken not to move hands and arms into and out of the cabinet unnecessarily. This action creates turbulence that reduces the laminar air flow characteristics and the effectiveness of the biosafety cabinet. A suitable disinfectant and laboratory wipes should always be available within the cabinet or on the supply cart or table directly adjacent to the biosafety cabinet.

#### PROCEDURE

To effectively clean and decontaminate a spill within the biosafety cabinet follow these steps:

1. With cabinet air flow running, cover the affected area immediately with absorbent material.
  - a. Using hospital-approved disinfectant, gently spray the top of the covered spill.
  - b. Leave for the recommended contact time.
  - c. Pick up the absorbent material and place in a small autoclave bag inside the biosafety cabinet.
  - d. Clean the affected area again with disinfectant. If chlorine bleach is used, the affected area should be cleaned with 70% ethanol afterward to remove residual bleach. Chlorine bleach will pit and corrode the stainless steel work area inside the biosafety cabinet.
  - e. Place the sealed bag in a biohazard waste receptacle.

## Appendix 1 – IX-02 SUMMARY OF INFECTIOUS/HAZARDOUS WASTE MANAGEMENT PLAN

Waste Category	Examples	Red Bag	Yellow Bag <sup>1</sup> (Incineration)	Yellow Container <sup>2</sup>	Black Bag (Sanitary Landfill)	Steam Sterilization
Microbiology	Stocks and cultures of infectious agents		X			X <sup>3</sup>
Anatomical waste	Tissues, organs, other body parts, specimens of body fluids and their containers (stored in lab for burial)	X				
Blood/blood products/body fluids: <u>All clinical areas:</u> <ul style="list-style-type: none"> <li>• &lt; 20-ml volumes</li> <li>• &gt; 20-ml volumes</li> </ul>	Blood containers, IV tubing without needles, suction canisters, pleurovacs, evacuated containers, hemovacs, etc.		X		X	
Items contaminated with blood: <ul style="list-style-type: none"> <li>• If saturated and/or dripping</li> <li>• Not saturated and/or dried</li> </ul>	Paper towel, gauze, disposable objects, gloves, etc.		X		X	
Chemotherapeutic waste	Bulk <sup>4</sup> chemicals and sharps			X		
	Trace <sup>5</sup> chemicals		X			
Sharps	Contaminated needles, syringes, scalpel blades, razors, pasteur pipettes, tubes and broken glass			X		
Contaminated animal carcasses, body parts, and bedding	Contaminated animal carcasses, body parts, and bedding of animals that were intentionally exposed to pathogens.		X			X <sup>3</sup>
Other hospital waste	Non-hazardous medical wastes				X	

<sup>1</sup> Yellow bags (150-micron thickness, leak-proof, labeled Cytotoxic and/or Biohazard as per [ICM IX-02 Waste management](#)).

<sup>2</sup> Yellow containers must be heavy-duty, leak-proof, and puncture-proof. Containers must be labeled as Biohazard or Cytotoxic separately as per ICM.

<sup>3</sup> If steam sterilization is not used, place in yellow bag for incineration.

<sup>4</sup> Waste materials contaminated with any visible liquid are classified as bulk chemical waste, including contaminated sharps. and must be incinerated at  $\geq 1200^{\circ}\text{C}$ .

<sup>5</sup> Waste materials contaminated with traces of chemotherapy agents (e.g., empty vials, IV tubing, gowns, gloves).

**Note:** Radioactive wastes should be placed in hermetically sealed containers with an international logo of Radiation Hazard.

TITLE/DESCRIPTION: <b>SINGLE USE DEVICES (SUD)</b>		INDEX NUMBER: <b>ICM – IX-03</b>
EFFECTIVE DATE: 01/01/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To outline a process for the evaluation, approval and appropriate decontamination and reprocessing of single-use devices (SUDs) when indicated.

## REFERENCES

1. Association for the Advancement of Medical Instrumentation. (2006). Comprehensive guide to steam sterilization and sterility assurance in healthcare facilities
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 20: Aseptic technique. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
3. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 33: Product evaluation. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
4. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 57: Reprocessing single-use devices. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
5. Drug and Health Products. Reprocessing of reusable and single-use medical devices. *Health Canada*, British Columbia. Available at: [www.bc-sc.gc.ca](http://www.bc-sc.gc.ca) Accessed: March 2009
6. John Hopkins Hospital. (2006). Reprocessing of single-use patient care items by third part vendors. *Interdisciplinary Clinical Practice Manual*. Policy No. IFC-004
7. Saudi Food and Drug Authority, Kingdom of Saudi Arabia. Available at: [www.sfda.gov.sa](http://www.sfda.gov.sa). Accessed: March 2009

## COMMENTS

1. The institutional facilities should not reprocess used SUDs for reuse because it is not safe.
2. SUD refers to a patient care item intended to be used once on an individual patient during a single procedure and then discarded. This item is labeled as “single-use” or “disposable.”
3. Reuse refers to the use of an item labeled by the original manufacturer as a single-use or disposable patient care item that has been cleaned, disinfected, or sterilized and then tested for functionality after its original use on a patient.
4. Reprocessing refers to the cleaning, disinfecting, repackaging, and sterilizing of an item that was either (a) used on a patient or (b) not used on a patient but has its original packaging compromised. Manufacturer’s instructions now known as information for use (IFU) must be adhered to when evaluating reprocessing of SUD.
5. Reprocessing a SUD may affect the function of the device and/or material from which the device is made. Single-use devices may not be designed to allow for thorough decontamination and re-sterilization processes. Unforeseen problems such as inadequate decontamination, material alteration, mechanical failure, and residual

chemical agents can render the reprocessed item unsafe. In addition, validation of the SUD's functionality after reprocessing cannot be guaranteed.

6. Critical and semi-critical medical equipment/devices labeled as single-use must not be reprocessed and reused unless the reprocessing is carried out by a licensed re-processor who can validate the functionality of the reprocessed SUD.

## PROCEDURE

1. SUDs must be discarded by the end user at the point of use as per hospital waste disposal protocol.
2. Examine used SUDs being considered for reuse on an individual basis and consider potential risk implications as follows:
  - a. Describe the item
  - b. Use of the item (i.e., invasive (critical) vs. non-invasive (non-critical))
  - c. Availability of manufacturer's IFU reprocessing instructions
  - d. Risks to the patient (i.e., infection and/or mechanical defects causing injury)
  - e. Quantity to be reprocessed
  - f. Cost per item
  - g. Is it a stock item
  - h. Nil stock (none in supply stores)
  - i. Next delivery date
  - j. Ethical, moral, and legal implications
3. Fill out a hospital standard written request for evaluation of the SUD.  
NB: If reuse of a SUD is considered, the conclusion must be influenced by unique circumstances pertaining to the individual device. Complete the attached evaluation form and forward it to Infection Prevention and Control department (IP&C).  
NB: If re-sterilization of unopened expired devices or opened unused devices is considered, the conclusion must be guided by the manufacturer's instructions/recommendations. Obtain and complete the appropriate form from Central Sterile Supply Department (CSSD).
4. Submit the SUD in its original packaging with all pertinent IFU along with a written request to the CSSD supervisor for review and assessment.
5. The CSSD supervisor assesses the item and discusses the findings with the IP&C to determine the appropriate course of action.
  - a. Risks involved with product safety and performance
  - b. Method of re-sterilization
  - c. Frequency of re-sterilization
  - d. Quality control

## Form 1-IX-03

## Evaluation for Reprocessing Single-Use Items/Devices

Requestor:		Date:
Name:		Badge #:
Title:		Department:

	Questions	Yes/No	Describe
1.	Describe the item Expiration date		
2.	Use of item (invasive or non-invasive)		
3.	Provide manufacturer's reprocessing instructions		
4.	Risks to the patient?		
5.	Quantity to be reprocessed?		
6.	Cost per item?		
7.	Is it a stock item? Oracle #		
8.	SPR #		
8.	Nil stock?		
9.	Next delivery date?		

Infection Control Department	
Evaluator:	Date:
Name:	Badge #:
Findings:	
Action:	



## Section 10: ENVIRONMENTAL HEALTH (New)

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ICM - X-02	<b>Hemodialysis Water Quality Monitoring</b>	<b>268</b>
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TITLE/DESCRIPTION: <b>WATER QUALITY MONITORING PROGRAMS AND REQUIREMENTS</b>		INDEX NUMBER: <b>ICM – X-01</b>
EFFECTIVE DATE: <b>01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To monitor the quality of water by defining the essential quality standards for water consumption at any healthcare facility; minimize microbial contamination of any water related health risk for patients, staff, and their community; and, meet the quality requirements of the Ministry of Health, the Joint Commission International, and other related international organizations.

## REFERENCES

1. American Institute of Architects Standards (2009)
2. ANSI/AMMI (2006). Water treatment equipment for hemodialysis applications. RD62
3. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 105: Water systems issues and prevention of waterborne infectious diseases in healthcare facilities. In *APIC Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
4. Association for the Advancement of Medical Instrumentation related standards (2007)
5. Canadian Drinking Water Quality Standards, 2001-2002
6. Environmental Protection Standards. Presidency of Metrology & Environment (PME). Saudi Arabia
7. Joint Commission International Hospital Accreditation Standards (2008, 3<sup>rd</sup> ed.)
8. National Guard Health Affairs. (rev. 2009). Water quality monitoring program and requirements. *Administrative Policies and Procedures*, 1426-15
9. Safe Drinking Water Act. (2002). Ontario
10. Saudi Arabian Standards Organization Guidelines for Water Testing, SASO/5-5667/2007
11. WHO Guidelines for Drinking Water Quality (2008) Second Addendum to Third Edition
12. WHO Potable Water Quality Guidelines (2004)

## COMMENTS

1. Drinking water quality standards at healthcare facilities must be maintained to protect patients, staff, visitors, and the whole community. These are legally enforceable to limit contamination and health hazards.
2. A monthly microbiological sampling and testing from all water supply areas must be conducted by the Infection Prevention and Control (IP&C) Department.
3. Immediate corrective action shall be taken as recommended by the IP&C for any potential water contamination or infection risk in coordination with concerned departments such as Utilities & Maintenance (U&M) and Primary Healthcare Clinics (PHC).
4. Laboratory facilities shall perform the required analysis for any urgent or corrective measure or routine water analysis to maintain acceptable water quality.
5. Records of laboratory results related to water quality monitoring shall be maintained by IP&C, U&M, and other concerned departments.
6. An effective preventive program which includes treatment such as chlorination, monitoring, cleaning water supply system, and sampling schedule will be designed and implemented by U&M.

7. All departments, divisions, employees, related contractors, and sub-contractors shall make the necessary precautions to avoid any contamination risk of water supply system due to the chemical used, renovation and construction, fire or other related industrial, agricultural, and human activities.

## PROCEDURES

1. Each facility must implement a routine maintenance program to maintain an acceptable clean water distribution system.
2. U&M will properly manage the chemical water treatment to ensure safe drinking water.
3. A safe water supply system must be equipped with back flow preventers to prevent back-siphonage, backpressure, and cross contamination. Only air gaps are recommended for preventing sewage back-siphonage contamination. To protect against backflow contamination of potable water supply by cross connections, either two check valves in series or a backflow preventer must be used i.e., a pumping device to prevent backflow.
4. U&M is responsible for making sure that there is sufficient water available in the hospital, its facilities, and residential compounds 24 hours a day and seven days a week. Other residential compounds' water safety and availability is the responsibility of the owner of the compounds and sampling must be conducted on monthly basis. Access must be guaranteed to IP&C and other concerned departments so they can regularly examine and test water safety in these residential compounds.
5. Chlorination systems will be checked daily by U&M to ensure that the chlorination compound supply has not run out and the applicable limits are maintained.
6. The Water Distribution Management Plan shall include the following elements:
  - 6.1 **Preventive measures.** A preventive maintenance program needs to include monitoring, inspection, cleaning, and disinfection of the water supply system, sampling schedule, and frequency for:
    - a. Potable water system
    - b. Hemodialysis and emergency water system
    - c. Domestic hot water system
    - d. Showers, faucets, humidifiers, fountains and HVAC drain pans
    - e. Recreation and irrigation water
  - 6.2 **Testing Equipment and Water Sampling**
    - a. A detailed physico-chemical potable water quality testing and sampling will be performed annually by an independent certified water-testing laboratory. A copy of the results must be forwarded to IP&C.
    - b. The preventive maintenance program will include periodic inspection and investigation to ensure that all water equipment is in good operational condition at all facilities.
    - c. Water quality testing for hemodialysis water shall be performed for chemical parameters as described in **Table 1-X-01** (*AAMI and EPA Maximum Allowable Levels of Contaminants in Water*) at least on a quarterly basis. A copy of these results must be forwarded to IP&C.
  - 6.3 **Corrective and Remedial Actions.** If pathogenic bacteria are present in the water distribution system during routine water sampling, appropriate corrective actions shall be taken immediately by U&M to correct and resolve this problem. Flushing the system and retesting upon the completion shall be conducted by IP&C to ensure safe water quality.
  - 6.4 Water contamination incidents must be reported to U&M, IP&C, and other needed departments or committees for analysis and action.

- 6.5 **Record keeping.** Records of water quality sampling results, laboratory reports, and chemicals used for treatment must be available at all times and be retained for a period of at least five years.
- 6.6. Maximum allowable levels of contaminants in water are as follows:
- a. **Physical Parameters.** The water shall be aesthetically acceptable to consumers. Unusual taste and color might be an indication of potential contamination. However, the maximum allowable physical parameters are as follows:
    - i. Color <15 TCU (True Color Unit)
    - ii. TDS  $\leq$  600 mg/L (Total Dissolved Solids)
    - iii. Turbidity < 5 NTU (Nephelometric Turbidity Units)
  - b. See *Table 1* for microbiological and chemical parameters.
- 6.7 **Water Sampling.** The monthly water sampling must be conducted in accordance with the following steps:
- a. Flush the tap for at least one minute. If the tap is a mixing faucet, attachments (i.e., screen and aerators) must be removed, hot and then cold water must be run through the tap for at least 1-10 minutes as per the location and the frequency of use.
  - b. Turn off the tap and disinfect the end of the tap by 70% isopropyl alcohol or by using 500-600ppm chlorine sodium hypochlorite (1:100 v/v dilution of chlorine bleach).
  - c. Turn on the tap and let it run for a few seconds before taking the sample.
  - d. Samples shall be collected in a sterile bag of minimum 100 ml capacity.
  - e. A reducing agent i.e., Sodium Thiosulphate [ $\text{Na}_2\text{S}_2\text{O}_3$ ] shall be added to neutralize residual chlorine and other halogens in the sample.
  - f. If the water contains elevated levels of heavy metals, then a chelating agent shall be added to the specimen.
  - g. Sample site, date and time shall be written on the label of each sample.
  - h. Water samples must be kept in cold (approximately 4°C) containers and sent immediately to the designated laboratory preferably within 24 hours.
  - i. In the laboratory, the use of sterile reduced nutrient media (e.g., diluted peptone and R<sub>2</sub>A) is preferable with either of the techniques like heterotrophic plate count, pour plate, and spread plate or membrane filtration.
  - j. Plates are incubated at 35°C within 24 hours for total coliform; and, at 44.5°C for fecal coliform within 48 hours.
- 6.8 **Emergency and Other Water System**
- a. Safety shower and eye wash stations shall be flushed weekly.
  - b. On a quarterly basis, all decorative fountains must be shut down, drained, cleaned, and disinfected by the related authority.
  - c. The hot water temperature shall be maintained in accordance with the American Institute of Architect's (AIA) guidance issued at the year in which the facility was constructed. Water temperature shall be maintained in patient care areas within the range of 105 - 120°F (40 - 49°C).
  - d. When shock decontamination of hot water system is necessary (e.g., after disruption caused by construction and after cross connection), the hot water temperature should be raised to 160-170°F (71-77°C) and maintained at the level while each outlet around the system is progressively flushed for a minimum of 5 minutes. U&M shall inform IP&C, the Safety Officer and other possible affected departments prior to shocking treatment in order to avoid scalding.
- 6.9 **Corrective and Remedial Action**
- a. Any contamination / complaint shall necessitate a complete investigation and immediate appropriate corrective action by IP&C and U&M.

- b. A corrective action plan shall be in place in response to various disease outbreaks or water contamination incidents.
  - c. Each unscheduled maintenance event shall be reviewed carefully to proceed without compromising the facility water supply.
  - d. The following steps shall be taken in consideration to minimize potential exposure risk:
    - i. Scheduling corrective work during period of low occupancy.
    - ii. Isolate work area by temporary barriers.
    - iii. Negative pressure environment must be maintained in worksite in relation to the space that adjoins the worksite in order to prevent transportation of pollutants.
    - iv. Using specialized cleaning procedure.
    - v. Changing air filters if necessary when work is completed.
- 6.10 **Chemical Use.** U&M will make sure that only IP&C approved chemicals are used in water treatment programs. Updated Material Safety Data Sheets and chemical inventories for chemicals added to water will be maintained.

### RESPONSIBILITY

IP&C, U&M, and all other departments involved in the water quality control, treatment, equipment installation, maintenance, renovation, and construction are responsible for the implementation and monitoring of this policy. Quality Management & Internal Audit is responsible for monitoring compliance to the provisions herein.

**Table 1 –X-01:  
AAMI and EPA Maximum Allowable Levels of Contaminants in Water**

Contaminant	AAMI Maximum for Dialysis Water, mg/L	EPA Maximum for Drinking Water, mg/L	WHO Guideline Values for Drinking Water, mg/L
Aluminum	0.01	0.05 to 0.2	0.2
Antimony	0.006	0.006	0.02
Arsenic	0.005	0.05	0.01
Barium	0.1	2	0.7
Beryllium	0.0004	0.004	Not regulated
Cadmium	0.001	0.005	0.003
Calcium	2 (0.1 mEq/L)	Not regulated	Not regulated
Chloramine	0.1	4.0 *	Not regulated
Chlorine	0.5	4.0 *	5.0 Residual free $\geq$ 0.5 at least 30 minutes contact time at pH < 8.0
Chromium	0.014	0.10	0.05
Copper	0.1	1.3 **	2
Fluoride	0.2	4.0	1.5
Lead	0.005	0.015 **	0.01
Magnesium	4 (0.3 mEq/L)	Not regulated	Not regulated
Mercury	0.0002	0.002	0.001
Nitrate	2	10	50 (short-term exposure)
Potassium	8 (0.2 mEq/L)	Not regulated	Not regulated
Selenium	0.09	0.05	0.01
Silver	0.005	0.10 *	Not regulated
Sodium	70 (3.0 mEq/L)	Not regulated	Not regulated
Sulfate	100	400/500 *	Not regulated
Thallium	0.002	0.002	Not regulated
Zinc	0.1	5 *	Not regulated
Bacteria	HPC 100 CFU/ml (Action level 50 CFU/ml)	HPC Bacteria 500 CFU/ml Coliform Bacteria 0 CFU/ml	Not regulated 0 CFU/ml
Endotoxin	0.25 EU/ml (Action level 0.125 EU/ml)	Not regulated	Not regulated

\* Unenforceable maximum contaminant level goal

\*\* Action level at 90<sup>th</sup> percentile

EPA – Environmental Protection Agency US

HPC – Heterotrophic Plate Count

CFU – Colony Forming Units

**Source:**

1. Association for the Advancement of Medical Instrumentation (AAMI). Water quality for dialysis [monograph]. In: AAMI standards and recommended practices. Vol.3. Arlington (VA): AAMI; 1998:262
2. Water treatment in Hemodialysis including the latest AAMI Standards, Nephrology Nursing Journal, December 2001- vol. 28, No. 6
3. Guidelines for Drinking Water Quality, 3<sup>rd</sup> ed. World Health Organization (2004) Geneva

TITLE/DESCRIPTION: <b>HEMODIALYSIS WATER QUALITY MONITORING</b>		INDEX NUMBER: <b>ICM – X-02</b>
EFFECTIVE DATE: <b>01/03/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To define the policy, procedures, and reporting requirements for the bacteriological and chemical testing and monitoring program of water used by the Hemodialysis Unit.

## REFERENCES

1. Association of the Advancement of Medical Instrumentation (AAMI) Standards for Hemodialysis Water Supply.
2. American National Standards Institute (ANSI).
3. Joint Commission International Hospital Accreditation Standards (2008). PCI, FMS.
4. Infection Prevention and Control Manual, [ICM-X-01](#), *Water Quality Monitoring Programs and Requirements*

## COMMENTS

1. This policy must always be utilized under normal circumstances. All recorded results are to be documented and communicated to all associated departments as specified.
2. Under emergency conditions in the event of a substandard result, the Hemodialysis Department Head must be notified immediately by telephone in order to take appropriate actions.
3. All results sheets for the test samples will be recorded in a uniform manner by all the concerned departments.
  - The location and outlet number must be clearly identified.
  - In case of abnormal results, the borderline will be according AAMI Standard ([Table 1-X-01](#) *AAMI and EPA Maximum Allowable Levels of Contaminants in Water*, p. 267).

## PROCEDURE

1. The point of reference or guideline for the general procedure is the AAMI standards.
2. The U&M Department will be responsible for operating the treatment plants and the piping to the user points in a manner that conforms with the guidelines. The Water Treatment Plant Foreman will ensure that the water is checked as per the related standard operating procedures (SOPs) and reported in writing to the IP&C and the head of the concerned department.
3. In addition, the Water Treatment Plant Foreman will submit a sample of treated water to an approved facility to determine the comprehensive ANSI / AAMI chemical analysis as per the related U&M Department SOPs.
4. The IP&C will collect water samples from the hemodialysis water treatment plants (pre-reverse osmosis and post-reverse osmosis water outlets) when operating:

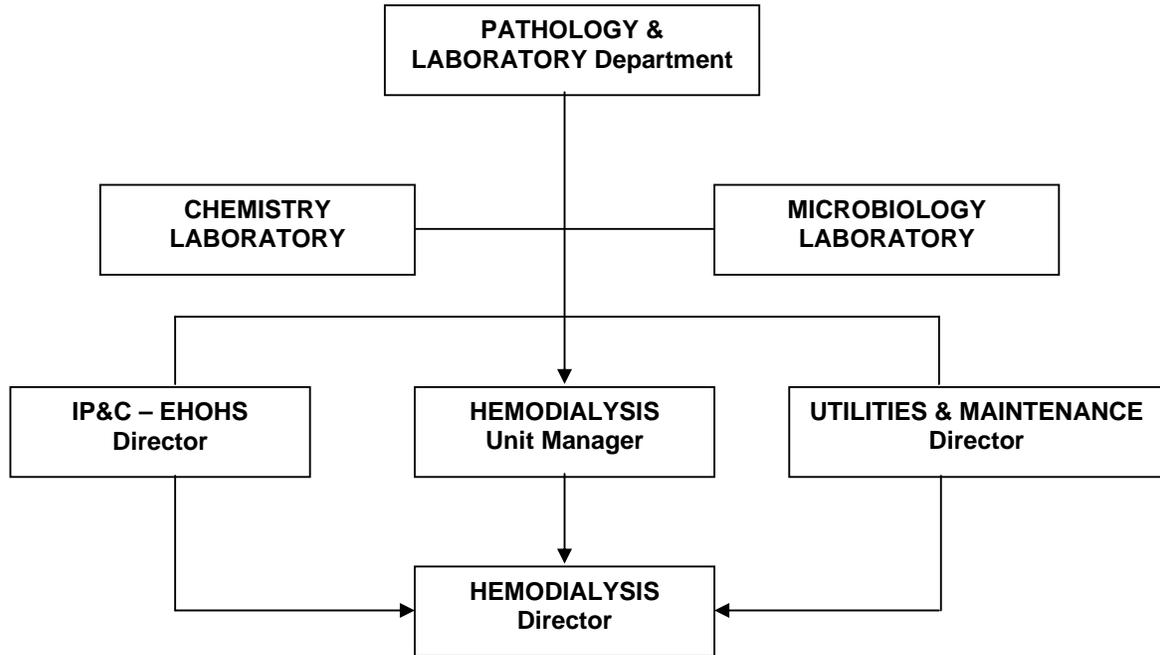
- 4.1 Once per month for endotoxin analysis for delivery to the chemistry laboratory using the sampling containers provided (non-pyrogenic containers).
- 4.2 Once per month collected water samples for analysis in sterile sample containers which contain sodium thiosulphate to neutralize the chlorine in the water for delivery to the microbiology laboratory for analysis. Chlorine levels will be noted for each sample at the time of collection.
5. A free chlorine residual of 0.3 mg/l will be maintained by the U&M Water Treatment Plant Foreman at all points in the hemodialysis water system. While some variation in levels is unavoidable, the chlorine levels should not drop below 0.1 or rise above 0.5 mg/l. Failure to achieve this would warrant immediate notification to IP&C and the Hemodialysis Department Head. Corrective action will be taken by the Water Treatment Section, U&M.
6. Collection of water for testing, including chemistry endotoxin analysis and aerobic colony count analysis from pre- and post-hemodialysis machines.
  - 6.1 Water samples will be collected and delivered by trained Hemodialysis unit staff to the Lab for testing. Analysis and reporting will follow as per related SOPs.
  - 6.2 All collecting staff will ensure that only sterile sample containers appropriate for the tests are used. These samples have to be delivered to the appropriate laboratory as soon as possible.
    - a. Bacteriological testing - samples for aerobic colony count to be delivered to the Microbiology Laboratory.
    - b. Endotoxin level testing - samples to be delivered to the Chemistry Laboratory.
7. The Hemodialysis Department Head, IP&C, and the laboratory staff will ensure that sampling procedures are appropriate. IP&C to ensure that the technique is appropriate and the results are valid.
8. Quality control for standards of sample collection will be provided by IP&C through in-service training.
9. All sample results will be reported by departments who collected the samples to the Hemodialysis Department Head. In the event of an abnormal result, the laboratory will immediately inform the directors of the hemodialysis unit, U&M division, and IP&C.
10. Representatives from IP&C, U&M, Laboratory and the Hemodialysis Unit will meet when needed to ensure effective communication, review current activities, and discuss any required changes / related issues. (See [Appendix 1-X-02 Water Quality Monitoring Reporting Responsibilities](#))

## RESPONSIBILITY

All departments involved in providing, maintaining, testing, and using water for Hemodialysis are responsible for adhering to the provisions as stipulated. The Quality Management Department is responsible for monitoring compliance to the provisions of this policy.

1. IP&C is responsible for conducting monthly water sampling; report the results; and, take corrective measures accordingly. IP&C serves as the reference point for training and consultations related to water quality standards.
2. U&M will maintain the reverse osmosis water treatment plants; do water sampling and testing; report the results; and, take corrective actions accordingly and as per their related SOPs and guidelines.
3. Hemodialysis Unit staff will conduct regular sampling from their unit and wherever the reverse osmosis outlets are; report the results; and, take perceptual actions toward patients accordingly, especially when abnormal results are reported.
4. Laboratory will receive the samples; analyze them; and, report results in a timely manner and as per related SOPs.

**Appendix 1-X-02:  
Water Quality Monitoring Reporting Responsibilities**



TITLE/DESCRIPTION: <b>HAZARDOUS CHEMICAL AND GASES SAMPLING</b>		INDEX NUMBER: <b>ICM – X-03</b>
EFFECTIVE DATE: 01/03/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To identify and outline the responsibilities of the Infection Prevention and Control or Environmental Health personnel in monitoring and taking environmental sampling for toxic and potentially hazardous gaseous pollutants in healthcare facilities.

## COMMENT

To identify, evaluate, and control potential risks from chemical, physical, and biological hazards--air sampling will be conducted when necessary to monitor workplace hazards.

Air sampling is used to:

1. Detect bio-aerosol released from the operation of healthcare equipment;
2. Determine the success of controls and repairs in containing the hazard;
3. Detect hazardous agents in an indoor environmental setting; and
4. Maintain industrial hygiene for safety purposes and quality assurance.

## PROCEDURE

### A. Biological Air Sampling

S/N	GAS/DUST	USED EQUIPMENT	MOST TARGETED AREAS
1	Ethylene Oxide , Mercury,	Sampling pump	CSSD, laboratory, wards
2	Organic Vapors as Xylene, Benzene, Glutaraldehyde, formalin	Photo ionization Monitor, passive sampling badges	Laboratories - histology, ECHO, microscopy
3	Oxygen level	Multi gas monitor	Basement, areas with potential gas leak, any area suspected with gas leak.
4	CO,CO2,NO, NO2 NH3	Multi gas monitor	Laboratory, NICU, workshops, power station
5	CH4=LEL	Multi gas monitor	Laboratory
6	Dust as Silica	Dust particulate	Dental Laboratory
7	Antineoplastic vapor	moistened wipe	Pharmacy

S/N	AREA	DEPARTMENT	GAS	HOW OFTEN
1	Laboratory	Histology	Xylene	Quarterly and when it necessary
2	Laboratory	Hematology Histology	Formalin (Formaldehydes)	Quarterly and when it necessary
3	Laboratory		CO2	As required
4	Laboratory	Toxicology	NO, H2	As necessary
5	Chemical Fume Hoods (CFH)	Where ever there CFH	Any gas generated in this CFH	As necessary

### B. Nitric Oxide (NO) and Nitrogen Dioxide (NO<sub>2</sub>) Gases in NICU Wards

Nitric oxide gas is used to treat neonatal babies suffering from hypertension. Risks associated to this procedure are as follow:

1. Nitric oxide (NO) permissible exposure level (PEL) in the human body should not exceed 20 ppm. Once nitric oxide leaks in the room, it will react with the oxygen in the room and will form nitrogen dioxide (NO<sub>2</sub>). The NO pressurized gas cylinder has two detectors: one for NO level that goes into the patient; and the other shows the level of NO<sub>2</sub>. Any damage on the NO cylinder can lead to an explosion.
2. Nitrogen dioxide (NO<sub>2</sub>) permissible exposure level is 1ppm. It is a highly toxic gas and its level should be maintained at less than 1ppm. IP&C staff should conduct regular inspection and have a portable detector that can detect both NO and NO<sub>2</sub> gases, as well as the oxygen level in the room.

### C. Calibrating Air Samplers

Sampling devices will be calibrated as per manufacturer's instrument and applicable standards in coordination with the clinical engineers. These devices have automatic data logging and analyzing features for quick accessibility and reporting of results.

### D. Safety Measures

1. Regularly observe the NO cylinder gas detectors. In case of leak:
  - a. Shut the flow of the gas.
  - b. Evacuate the patient to a place with fresh air.
  - c. Call the clinical engineer and IP&C or Environmental Health staff.
2. Keep the cylinder in upright position even when empty.
3. Read the material safety data sheets (MSDS) that tell the symptoms associated with overexposure to hazardous agents.
4. Should there be symptoms or cases of overexposure, seek medical advice and make the necessary reporting procedures to the concerned departments.

TITLE/DESCRIPTION: <b>MICROBIAL AIR SAMPLING IN PATIENT CARE AREAS</b>		INDEX NUMBER: <b>ICM – X-04</b>
EFFECTIVE DATE: 01/03/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To mitigate dusts and determine number and types of microorganisms present in the patient's room through microbial air sampling techniques.

## REFERENCE

Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). (2003). Guidelines for environmental infection control in healthcare facilities.

## PROCEDURE

### A. Responsibility

1. IP&C's Environmental Health personnel will:
  - 1.1 Perform pre-sampling walk-through assessment and documentation of findings utilizing the appropriate forms.
  - 1.2 Perform fungal sampling using the biological air sampler (e.g., Biotest RCS Centrifugal Air Sampler) or any other instrument deemed appropriate by the department.
2. Engineering Services or any related engineering party will :
  - 2.1 Complete the air sampling request form to be sent to IP&C.
  - 2.2 Advise IP&C of upcoming construction or maintenance projects.
  - 2.3 Advise IP&C of dates of specific construction and demolition phases to allow timely ordering of air sampling.
  - 2.4 Check HVAC, complete air balancing, make sure that no other engineering work is required to complete before requesting air sampling.
3. Internal Audit and Organizational Development is responsible for monitoring compliance to the provisions stipulated herein.

### B. Acceptable Range of Air Samples

1. Aerobic cultures should not exceed 10 fungal colony forming units per cubic meter (CFU/m<sup>3</sup>) and not ≥2 CFU/M<sup>3</sup> of *A. Fumigatus* in any patient care area.
2. For areas of high risk patients (e.g., hematology/oncology and liver or bone marrow transplant), aerobic cultures should have no fungal growth.

### C. Equipment for Sampling

1. Biotest RCS Centrifugal Air Sampler uses fungal media strip (SDX agar), or any other approved device. An unopened "control" strip should be included with each sampling.
2. If the centrifugal sampling device is not available, air sampling may be conducted using settling plates with an appropriately selected media which may be obtained from Microbiology Laboratory.

#### D. Role of Environmental Health Specialist or Designated Trained Personnel

1. IP&C environmental health staff should coordinate the schedule of air sampling / observation that will be conducted with the involved unit/department(s).
2. 24 hours after any dust generating procedure (e.g., drilling, construction, etc.) the Environmental Health Specialist collects air samples using the centrifugal air sampler.
3. The reporting format should list items that need to be addressed during the observation period, such as: physical condition of the area; amount of traffic; time and weather conditions; open vs. closed windows and doors; etc. Observations should include factors associated with increased risk of the presence of fungal spores from plants; holes in ceiling or walls; or, other possible sources of dust.
4. IP&C environmental health staff submits the air sampling specimen to the microbiology laboratory for culture test. It is recommended that IP&C submitted specimens should be assigned specific access code for easy retrieval of results from the Laboratory Information System.
3. Microbiology laboratory is expected to report culture results after 5-6 days of incubation.
4. Areas with results greater than the acceptable range are subject for repeat air sampling after further investigation by the IP&C and the facility management department of the hospital to determine possible sources causing elevated fungal counts. Intervention strategies should be taken and subject for further discussion during Infection Control Committee meetings.
5. Regular reports, culture results, interventions, and evaluations made from scheduled air sampling observations as well as pre-sampling walk-through assessments is generated by the IP&C Department and submitted to the concerned unit/department.

#### E. Air Sampling

1. Routine and Ad-hoc Air Sampling:
  - 1.1 Provided that engineering air ventilation parameters are satisfactory and regularly monitored, microbiological air sampling may be done on an ad-hoc basis.
  - 1.2 Ad-hoc sampling may be requested in cases of identified healthcare-associated mycosis or a potential cluster of fungal disease from construction projects.
2. Construction Projects:
  - 2.1 Air sampling test should be conducted as basis for the completion of an Infection and Environmental Control Risk Assessment for each project.
    - a. During the pre-construction stage, the engineering party should submit an Infection Control Risk Assessment Permit Form (refer to [Appendix 1-X-09](#) pp. 302-303) for each construction project to the IP&C for evaluation and approval.
    - b. Concerned departments with construction project should fill up an air sampling request form addressed to the IP&C Department.
    - c. IP&C should be copy furnished with the completed "Microbiology Requisition for Air Samples" form ([Form 1-X-04](#) *Microbiology Requisition Form for Air Samples*).
  - 2.2 Locations and schedule of testing dates for the conduct of air sampling will be decided during construction and/or maintenance project planning and site walk through. Locations and target dates for project commissioning should be indicated in the "Environmental Sampling Request" form submitted to the IP&C.
  - 2.3 Sampling from external open air or ambient shall be collected with each microbial air sampling as a variable for testing media and device.
  - 2.4 Investigation of the air quality of patients' rooms diagnosed with or suspected of having a healthcare-associated fungal infection of the lower respiratory tract shall be requested by Hospital Infection Control as follows:
    - a. A single sample in the room occupied by the patient at symptom onset.
    - b. Inspection of fan room with filtration or any part of the mechanical ventilation system that supplies air in the involved patient care room(s).

Form 1-X-04

Microbiology Requisition Form for Air Samples

Contact name for questions: \_\_\_\_\_ Ext: \_\_\_\_\_

Date & Time of Collection: \_\_\_\_\_

Reason for request:

New Construction

Other Untoward Event

Previous High Count: \_\_\_\_\_

Justification:

\_\_\_\_\_  
 \_\_\_\_\_

Technician Name: \_\_\_\_\_

Humidity: \_\_\_\_\_

Temperature: \_\_\_\_\_

For Laboratory Use Only  
 Order Code: P039  
 SDES: Air  
 SREQ: Enter site samples

Location	Sampling Completed	Particle Count	Observation

TITLE/DESCRIPTION: <b>CSSD HEALTH CHALLENGES</b>		INDEX NUMBER: <b>ICM – X-05</b>
EFFECTIVE DATE: <b>01/03/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To protect the Central Supplies and Sterilization Department (CSSD) staff from any occupational and environmental risks exposure.

## COMMENTS

The CSSD has a special role in environmental health and occupational health safety (EHOHS) as CSSD is exposed to cleaning and disinfecting agents which control infection from spreading in the hospital environment.

## PROCEDURES

- A. Chemical use:** IP&C should evaluate and approve any chemicals being used in CSSD. Materials and Safety Data Sheets (MSDS) of chemicals must be regularly reviewed and updated. CSSD policies and procedures should be in sync with the infection prevention and control (IP&C) regulations and standards.
- B. Burns / cuts:** CSSD employees are exposed to possible burns or cuts that can occur from handling or sorting hot sterilized items or sharp instruments when removing those from autoclaves/sterilizers or from steam liners. Possible solutions to avoid these risks are:
1. Establish work practices to prevent hazards such as:
    - a. Do not remove items from sterilizers until cooled.
    - b. Avoid handling sharp ends of instruments.
    - c. Use forceps or other devices to remove sharp instruments from baskets and autoclaves.
  2. Use appropriate Personal Protective Equipment (PPE), especially, hand protection gears such as oven mitts to protect the hands when handling hot items, and steel mesh or Kevlar gloves when handling or sorting sharp instruments.
- C. Hazardous chemicals:** Unlabeled chemicals used in the initial washing process of dirty instruments as well as untrained employees on hazardous chemicals pose as occupational risks. Training on work practices that comply with the Hazard Communication Standards should be provided to all employees. Warning labels and easy access to MSDS should be in place. Other ways to avoid workplace hazard are:
1. Provide appropriate PPE such as gloves, goggles, and splash aprons when handling hazardous dishwashing detergents and chemicals.
  2. Where the eyes or body of any person may be exposed to injurious corrosive materials, medical services and first aid should be readily provided and suitable facilities for quick drenching or flushing the eyes and body should be available within the work area for immediate emergency use.
  3. Use automatic dishwashing machines that automate the dispensing of chemicals used for washing to minimize employee exposure to chemicals. Workers must be cautious and must use appropriate PPE (e.g., goggles, and/or gloves) when changing detergent and other chemical containers.

- D. Slips, Trips, and Falls:** CSSD employees are exposed to slippery floors due to steam and washing processes.
1. Keep floors clean and dry to avoid slips. Wet surfaces enhance the growth of molds, fungi, and bacteria, which can cause infections.
  2. Keep aisles and passageways clear and properly maintained with no unnecessary obstruction that can create hazards. Provide sufficient and accessible floor or ceiling electrical outlets for equipment to avoid trips due to crisscrossing power cords.
- E. Blood borne Pathogens:** CSSD employees are exposed to blood borne pathogens and other potentially infectious materials such as bloody, contaminated surgical instruments and sharps (e.g., needles, scalpels). Employees must safely discard disposable sharp items and reprocess reusable instruments/equipment.

**RESPONSIBILITIES**

IP&C conducts regular multidisciplinary environmental rounds (MDER) to monitor CSSD practices. CSSD-related occupational hazards should be immediately investigated including microbiological water testing done on a monthly basis or when specific need arises. The table below provides MDER indicators for monitoring:

ITEMS	INDICATOR	MDER SCHEDULE	IN-CHARGE
1. Water quality	Hardness	Weekly	U & M
2. Air quality	a. Air changes	Monthly or when required	U & M
	b. Air Pressure	Quarterly or when required	U & M
	c. Toxic gases <ul style="list-style-type: none"> <li>• Ethylene oxide</li> <li>• Hydrogen peroxide</li> </ul>	When alarm is on or when necessary. Quarterly/when necessary	IP&C - EHOHS IP&C - EHOHS
3. PPE	Use and availability	On regular basis	IP&C – EHOHS
4. Chemical Hygiene		On regular basis	IP&C – EHOHS

TITLE/DESCRIPTION: <b>FOOD HYGIENE</b>		INDEX NUMBER: <b>ICM – X-06</b>
EFFECTIVE DATE: <b>01/03/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To provide guidelines on the proper food preparation, distribution, and vending in healthcare facilities.

## REFERENCES

1. Food and Drug Administration (FDA)
2. Infection Control Manual, [ICM-VIII-01](#) *Nutrition Services*
3. Appendix B Gaudiness Based on Hazard Analysis and Critical Control Points (HACCP) Principles.

## COMMENT

All food services and contractors must comply with the applicable IP&C Environmental Health and Occupational Health & Safety (EHOHS) standards and regulation. Routine food hygiene inspection shall be conducted regularly by EHOHS without any notice. Food services and contractor staff cooperate with EHOHS inspectors and immediately correct any related infraction in ensuring safe food quality and services.

## PROCEDURES

### A. Food Handlers

1. Food handlers must complete the pre-employment screening process and shall abide with Employee Health Guidelines.
2. Food service supervisors are responsible for providing updated lists of food handlers as well as employee arrivals, transfers, and departures to the Pre-Employment / Surveillance Clinic of the Infection Prevention and Control Department.
3. Food service supervisors are responsible for registering all their food handlers with the IP&C. No food handler may be allowed to engage in food services without obtaining a valid health certification and Food Handler identification card from the IP&C.

### B. Personal hygiene

1. The Environmental Health Specialist will ensure that food service supervisors train, monitor, and check daily their food handlers' personal hygiene including presence of infected cuts, boils, respiratory complications, or any other evidence of health associated infection.
2. Food services employees shall wash their hands thoroughly before starting work; after using the toilet; after touching their ears, nose, mouth, or hair; after handling food; after handling any food waste; before and after any cleaning procedures; after handling raw food; before moving from a raw food preparation area to cook foods; after eating, drinking, or smoking; after removing gloves; after handling soiled articles or trash.
3. Food handlers shall not eat, drink, or smoke in food preparation areas.
4. Nails shall be kept clean and trimmed to the tip of the finger.
5. Jewelries shall not be worn when at work.

6. Disposable protective gloves shall be worn when serving food and/or handling cooked and uncooked food.
7. Proper protective clothing shall be worn as necessary which include clean uniforms, aprons, hair nets, gloves, and closed shoes. Open sandals and bare feet are prohibited in the food handling areas.
8. Smoking, chewing gum, eating or drinking are prohibited in the kitchen; food handling, preparation and serving areas.
9. Food shall not be tasted by hand or with the same utensils used in the food preparation
10. Regular inspection of employees and their work habits shall be conducted. Violation of hygienic practices shall be dealt with disciplinary sanctions.
11. Continuous education and training of all food handlers may include, but not limited to:
  - a. Hand washing
  - b. Sanitizing equipment
  - c. Temperature and bacterial growth
  - d. Personal hygiene
  - e. Preparation and storage of food item
  - f. Transportation and service of food items
  - g. Handling of refuse or waste disposal

### C. Equipment features

1. Easily disassembled for cleaning.
2. Smooth surfaces are free of pits, crevices, ledges, bolts, and rivet heads.
3. Rounded edges and internal curves covered with finished smooth surfaces.
4. Coating materials resistant to cracking and chipping.
5. Non-toxic and non-absorbent materials that does not impart odor, color, or taste to food.
6. Preferably food contact surfaces should be made of stainless steel material.
7. Cutting/chopping boards are frequently identified as source of cross contamination. Cutting boards shall be made of non-absorbent materials and resistant to knife cuts and cracks. Cutting boards shall be washed and sanitized properly after each use. Color-coded boards shall be provided for different food preparation activities.
8. Floor mounted equipment should be either sealed directly to the floor or mounted at least 15 cm from the floor.
9. Processing equipment should have 0.5m of clear space around its perimeter to facilitate cleaning and maintenance.
10. Any equipment or utensils including cutting boards with crack or chipped part shall be discarded and replaced.
11. Cleaning schedules and protocols shall be detailed and comprehensive to include every piece of equipment including mobile items, fixtures, floors, walls, and all other areas of the kitchen and food service area.
12. Refrigerators, dishwashing machines, and hot holding cabinets will be monitored daily for correct temperatures and temperature logs shall be kept.
13. Refrigerators, hot holding cabinets, and ice chests will be cleaned and sanitized when visibly dirty and weekly.

### D. Food Handling

1. Frozen meat/poultry/fish shall be thawed either in a refrigerator with cover, date-labeled, and placed in a drip pan; or immersed under running water; or in a microwave for immediate cooking.
2. Raw fruits and vegetables shall be washed thoroughly before being cooked. Raw vegetables and fruits to be served raw shall be sanitized in a solution of 100-mg/l residual chlorine within a minimum of 10 minutes contact time.
3. Cross contamination via raw food to processed food or soiled utensils to food shall be avoided at all times.

4. Food and utensils being transported must be properly covered and kept at room temperature inside clean vehicles. Chilled food should be transported in refrigerated vehicles or cold containers; while hot food shall be transported in insulated containers.
5. Food items should not be left uncovered in areas where flies, insects, dusts, or other agents may contaminate them.
6. Within the food service area and any patient kitchenette area operated by the Food Service Department, only hospital prepared food should be stored in the refrigerator.
7. Food samples of all prepared and distributed meals should be properly labeled when stored in the refrigerator for a maximum of twenty-four hours only.
8. Food on display shall be protected from contamination by using easily cleaned counter-protector casing and similar equipment. Utensil dispensers should be separated from the food service counter, especially in self-service areas.
9. Food should not be prepared way in advance of the intended service time.
10. Kitchen supervisors shall conduct regular food and sanitation inspections and document findings, recommendations, and required actions.

#### **E. Storage**

1. Storage ruling should follow “first in - first out” stock rotation. Items that will expire first not those that were received first shall be used first.
2. All stored items shall be examined regularly for signs of dents, cracks, or swollen cans, pest infestation, and expiration dates.
3. Unused, damaged and/or expired items should be discarded by writing them off the list and removing them from the storage premises to avoid mixing with regular stock.
4. Edible and uncooked food products should not be stored in the same area as cleaning products.
5. Food items should be stored separately under room temperature.
6. Storage cabinets must be at least six inches above the floor and eighteen inches from the ceiling. No food shall be stored under water sprinklers or piping.
7. Dry food products shall not be stored under exposed sewer lines or in areas subject to flooding, drainage, overhead leakage or condensation. They shall be protected from contamination and adulteration by all agents including dust, insects, vermin, toxic substances, unclean equipment and utensils.
8. Bulk storage containers and container covers shall be labeled properly to identify stored food by their common name. Using cloth towels or plastic bags for storage is prohibited.
9. Properly designed and constructed plastic or stainless steel scoops shall be provided for bulk ingredients/food dispensing. Scoops shall be dipped into the bulk food item with the handle extended upward.
10. Single service articles shall be stored in closed containers that protect them from contamination, displayed and handled in a manner that prevents contamination.
11. Freezers shall be defrosted regularly.

#### **F. Temperature requirements**

1. Ambient temperature in all kitchen areas shall not exceed 30°C.
2. Food requiring refrigeration shall be kept at 4°C. Raw vegetables and fruits may be stored at temperatures up to 10°C. Food to be served shall be kept at a temperature of 4°C.
3. Freezing temperature is at -18°C or below.
4. Food shall be cooked at a minimum temperature of 60°C. Cooked food to be served shall be held at 60°C or more.
5. Food shall be reheated rapidly up to a temperature of 74°C.

### G. Cleaning and sanitization of utensils

1. Utensils shall be disassembled before cleaning.
2. Cleaning utensils using a dishwasher should maintain the wash/rinse cycle temperature at 74°C and the sanitization temperature at 82°C.
3. Manual washing should be done in a four-compartment sink. The sanitization phase can be done by using hot water (77°C) or by contact with a solution of 100-ppm residual chlorine for 30 seconds.
4. Manual dishwasher shall be designed into pre-scrape, wash, rinse and sanitize compartments with splash guard installed on both sides of the (4) compartments sink.
5. All cleaned and sanitized equipment shall be allowed to air dry or drained (bottoms-up) on racks in a separate area. Towel drying is prohibited.

### H. Waste disposal and pest control

1. Refuse bin, trash can, or dumpster must be kept covered at all times. These must be emptied frequently from the kitchen area.
2. The garbage room's walls, ceilings, floor and all attachments shall be constructed of smooth, easily cleanable, non-absorbent material. The floor shall be sloped leading to a trapped floor drain. The structure should be insect and rodent proof and the entrance to the room shall be fitted with an air curtain device. The room should be thoroughly clean, disinfected twice daily and properly maintained. Garbage storage room shall not be located inside the food facility unless they are cooled at 5°C.
3. Refuse containers distributed around the kitchen shall be thoroughly washed with hot water and detergent outside of the kitchen whenever emptied.
4. Pest control practices will be implemented in coordination with the Pest Control Committee.
5. All outer openings shall be kept closed at all times, to minimize entrance of flies, rodents and other vermin to the Food Service area.

### I. Design and construction

1. False ceilings are not recommended, if installed, it should be constructed completely sealed off from the processing areas.
2. Wall, floors, and ceilings should be impervious to water, non-absorbent, free of cracks and crevices, resistant to chemicals, easily cleaned, and properly maintained.
3. There should be an orderly sequential handling of the product from the receiving dock, into the storage area, to the preparation area, process area, packaging area, and serving area.
4. Stainless steel is the preferred material for food contact surfaces. Any other material to be used should be resistant to corrosion, abrasion and thermal shock, easily cleanable and resistant to sanitizers.
5. Dressing rooms or lockers should be provided for employees.
6. Hand washing facilities shall be in locations accessible to food service staff where hands are more likely to become soiled, especially in food preparation and serving areas, locker rooms, and dressing rooms. Sinks shall be provided with warm running water, hand soap, and paper towel dispensers at all times.
7. Floors in kitchen areas and toilet rooms should be sloped to 1/8 to 1/4 in/ft to a drain. A trapped floor drain is needed for every 400 ft<sup>2</sup> of floor area, with the length of travel to the drain not more than 15 ft.
8. The line or point of junction between the wall and the floor, and with built-in equipment should form a tight sanitary cove and smooth flush connection.
9. The wall painting should be light colored in work and processing areas.

10. Hollow walls and partitions, hung ceilings and boxed-in pipes and equipment shall be eliminated.
11. A minimum of 30 ft-c (candle) to 100 ft-c lighting shall be maintained, 70 ft-c is the minimum requirement for the kitchen and food processing areas.
12. Food facility construction plans whether newly constructed or remodeled food facility shall be submitted to the Infection Prevention and Control Department (EHOHS section) for review and approval.
13. Food facilities shall submit the menu for review and approval.
14. All newly constructed and/or remodeled food facilities in any hospital shall be inspected prior to opening for business.

#### J. Maintenance

1. Utilities and Maintenance Department should maintain a schedule for routine inspection and cleaning of ventilation ducts and lights.
2. There should be a schedule for preventive maintenance of all equipment to ensure proper functioning at all times.
3. There must be a procedure for sanitizing equipment after maintenance work.
4. Greasy filter hoods should be removed, cleaned, and sanitized using a 100-ppm chlorine solution on a monthly basis and when necessary.

#### K. Signage

The following signs must be displayed in specific places in the Food Service areas.

Sign	Place
No Smoking	Food Preparation Area
Wash Your Hands	Inside lavatory doors and over wash basins
Temperature Charts	On dishwashers, freezers, and refrigerators
Equipment Cleaning	On or near all equipment
Cleaning Schedules	On bulletin boards

#### L. Cleaning procedures

Cleaning materials include: clean cloth, germicidal detergent, clean mops, buckets, clean dust mops, upholstery cleaning solution, bucket for germicidal solution, rubber gloves, and vacuum cleaner.

1. All used dishes will be removed from dining tables as soon as possible after use.
2. Used dishes will be collected and stored in covered carts in the dining halls. Full carts will be transported to the dishwashing area of the kitchen, cleared, and placed in the dishwasher.
3. Tabletops in the dining halls will be cleaned with detergent germicide when soiled and after every clearance of meal trays or dishes.
4. All chairs and wall benches will be cleaned of spillage. When soiled, they will be shampooed with upholstery cleaning solution. Wall benches will be vacuumed before being shampooed.
5. All windows will be cleaned once every week and spot cleaned whenever soiled.
6. All walls will be washed once a month and spot cleaned daily.
7. All space dividers will be cleaned with a detergent germicide once a month.
8. Plastic plants will be dusted weekly and washed once per month.

9. All ceiling vents will be cleaned once a month.
10. All floors will be wet-mopped after each meal service. When wet mopping, all dirt and trash must be picked up at once and not allowed to accumulate in walkways.
11. All floors in dining halls will be kept free of spilled foods, mopped daily, and cleaned with a scrubbing machine once a week. Dining halls may be closed for cleaning for one hour during the night shift. Chairs will be pulled out from the tables and floors scrubbed using detergent germicide.
12. Containers of sugar and other condiments shall be kept clean at all times.
13. All used cleaning cloths and mops will be placed in plastic bags and sent for laundering daily.
14. Mops and buckets must be rinsed and emptied after use. Buckets must not be left with dirty mop and water in them; they should be cleaned thoroughly after use.

TITLE/DESCRIPTION: <b>HOUSEKEEPING</b>		INDEX NUMBER: <b>ICM – X-07</b>
EFFECTIVE DATE: 01/03/2009 01/01/2013	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To develop and maintain effective and efficient cleaning methods and schedules which are necessary to provide a clean healthy environment for patients, staff and visitors.

## POLICY

1. There will be an appropriate written schedule for cleaning and decontamination of all areas of the hospital.
2. Routine cleaning procedures shall be effective and consistent.
3. Cleaning products shall be selected on the basis of uses, efficacy, acceptability, safety and cost.
4. All cleaning products shall be approved by the IP&C and their MSDS available for reference. All chemicals used by Environmental Services shall be approved by EHOHS through the related MSDS prior to any use or purchase.
5. Cleaning activities shall minimize turbulence to prevent the dispersion of dust that may contain microorganisms.
6. All housekeeping staff shall be made aware of and adhere to isolation precautions in patient care areas.

## PROCEDURE

1. Standard Precautions: All housekeeping staff shall adhere to Standard Precautions when cleaning a room.
2. Transmission-based Precautions: All housekeeping staff shall adhere to airborne, droplet and contact precautions when cleaning a room.
3. Personal Protective Equipment: Gloves shall be worn when performing any cleaning activities. Disposable gloves shall be used except where there is a high risk of percutaneous injury when heavy-duty gloves shall be worn. Personal protective equipment shall be worn according to transmission-based isolation precautions used in patient's room.

## RESPONSIBILITIES

1. Contract managers and supervisors must assess the competency of employees by observing the techniques of the worker using written criteria that have been previously explained and demonstrated to the employee. If literacy and/or proficiency in English is not a problem, written tests can be administered.
2. All Housekeeping Managers and Supervisors who are responsible for the selection and use of cleaning products and the education of their staff shall have an understanding of the differences between a disinfectant detergent and a non-disinfectant cleaning agent.
3. Infection Prevention & Control especially its Environmental Health and Occupational Health & Safety Section must have a thorough knowledge of the cleaning agents and disinfectants used by Housekeeping Services.
4. Environmental Services must comply with all the applicable regulations and standards of EHOHS, IPC, OSHA and other related national and international safety regulations to prevent potential contamination, minimize risk and maintain safe environment.

## COMMENTS

### A. Principles and Methods of Disinfection of Equipment and Supplies (Factors Affecting Disinfectant Activity)

1. Concentration of Disinfectant: In general, the more concentrated, the greater the killing capacity of a chemical. However, the higher the concentration, the more likely a chemical will damage the surface that it is designed to disinfect.
2. A successful product must be effective at a low but sufficient concentration to avoid corrosion, staining, or other damaging effects to inanimate surfaces, hands, and mucous membranes of the personnel.
3. If the concentration is too low, the killing capacity of the chemical is decreased.
4. The greater the number of microbes present, the more difficult the surface is to disinfect.

### B. Cleanliness of the Surface (Basic Principles)

1. Physical protection of the microbe is afforded by soil. The disinfectant must penetrate the microbial cell to destroy it.
2. Organic matter may contain large numbers of bacteria.
3. Organic matter may inactivate the disinfectant; therefore, cleaning must precede disinfection.
4. Residual detergents from cleaning may inactivate the disinfectant; therefore rinsing is important.
5. Disinfection requires that the object to be disinfected have direct contact with the wet disinfecting agent for a specified time.
6. The exact contact time required depends on the disinfectant used and all the other factors that affect disinfectant activity.
7. The number of surviving organisms decreases with time of exposure to the disinfectant.
8. Water hardness – the presence of soluble calcium or magnesium compounds in water; they react with soap to form an insoluble precipitate and tend to neutralize some disinfectants.

### C. Resources Required

1. Approved disinfectants, disinfectant detergents and non-disinfectant cleaning agents.
2. Personal protective equipment.
3. Adequate supply of cleaning equipment.

### D. Principles of Cleaning and Disinfecting Environmental Surfaces

Environmental surfaces include medical equipment surfaces and housekeeping surfaces. Although microbiologically contaminated surfaces can serve as reservoirs of potential pathogens, these surfaces are generally not directly associated with transmission of infections to either staff or patients. The spread of microorganisms from environmental surfaces to patients is largely via hand contact with the surface. While hand hygiene is important to minimize the impact of this spread, cleaning and disinfecting environmental surfaces as appropriate is fundamental in reducing their potential contribution to the incidence of healthcare associated infections.

According to the Spaulding classification, environmental surfaces are “non-critical” surfaces that generally do not come into direct contact with patients during care. These surfaces carry the least risk of disease transmission and can be safely decontaminated using less rigorous methods of disinfection. Low-level disinfectants also referred to as sanitizers, are satisfactory and these include quaternary ammonium compounds, some phenolics, and some iodophors.

Germicidal chemicals cleared as skin antiseptics are not appropriate for use as environmental surface disinfectants.

Cleaning is the necessary first step of any sterilization or disinfection process. Cleaning is a form of decontamination that renders the environmental surface safe to handle or use by removing organic matter, salts, and visible soils, all of which interfere with microbial inactivation.

The physical action of scrubbing with detergents and surfactants and rinsing with water removes large numbers of microorganisms from surfaces. If the surface is not cleaned before the terminal reprocessing procedures are started, then the success of the disinfection process is compromised.

### **E. Strategies for Routine Cleaning of Medical Equipment**

Manufacturers of medical equipment should provide care and maintenance instructions specific to their equipment. These instructions should include information about materials compatibility with chemical germicides, whether or not the equipment can be safely immersed for cleaning, and how the equipment should be decontaminated if servicing is required.

Barrier protection of surfaces and equipment is useful, especially if these surfaces are:

1. Touched frequently by gloved hands during the delivery of patient care;
2. Likely to become contaminated with body substances;
3. Difficult to clean.

Impervious-backed paper, aluminum foil, plastic or fluid-resistant covers are suitable for use as barrier protection.

### **F. Strategies for Routine Cleaning of Housekeeping Surfaces**

Housekeeping surfaces require regular cleaning and removal of soil and dust using a detergent/disinfectant.

Extraordinary cleaning and decontamination of floors in healthcare settings is unwarranted. Studies have demonstrated that disinfection of floors offer no significant advantage over regular detergent/water cleaning and has little or no impact on the occurrence of healthcare-associated infections. Further, newly cleaned floors become rapidly re-contaminated from airborne microorganisms and those transferred from shoes, equipment wheels, and body substances. Cleaning methods that produce minimal mists and aerosols or dispersion of dust in patient-care areas are preferred.

Part of the cleaning strategy is to minimize contamination of cleaning solutions and cleaning tools. Bucket solutions become contaminated almost immediately during cleaning, and continued use of the solution transfers increasing numbers of microorganisms to each subsequent surface to be cleaned. Cleaning solutions should be replaced frequently. Laundering of cloths and mop heads after use and allowing them to dry before re-use, can help to minimize the degree of contamination.

Another reservoir for microorganisms in the cleaning process may be dilute solutions of the detergents or disinfectants, especially if the working solution is prepared in a dirty container and stored for long periods of time.

### G. Recommendations for Routine Cleaning of Housekeeping Surfaces

1. Do not use high-level disinfectants/liquid chemical sterilants on non-critical surfaces for disinfection.
2. Keep housekeeping surfaces (e.g. floors, walls, tabletops) visibly clean on a regular basis and as spills occur.
  - a. Use an EPA registered hospital grade disinfectant/detergent designed for general housekeeping purposes.
  - b. Follow manufacturers' instructions for proper use of cleaning/disinfecting products, paying close attention to specified use dilutions and stated contact times.
  - c. Never mix different housekeeping solutions.
  - d. Clean and disinfect high touch surfaces (e.g. door knobs, bed rails, light switches, surfaces in and around toilets in patients' rooms) on a more frequent schedule compared to that for minimal touch housekeeping surfaces (see Housekeeping DPP).
  - e. Clean walls, blinds, and window curtains in patient care areas when they are visibly dusty or soiled.
3. Do not use disinfectant fogging for any purposes in patient care areas.
4. Avoid large-surface cleaning methods that produce mist or aerosols or disperse dust in patient care areas.
5. Follow proper procedures for effective use of mops, cloths, and solutions:
  - a. Prepare cleaning solutions daily or as needed, and replace with fresh solutions frequently.
  - b. Use clean mops and cloths every time a bucket of cleaning solution is emptied and replenished with clean, fresh solution.
  - c. Clean mops and cloths after use and allow to dry before reuse or use single-use, disposable mop heads and cloths.
  - d. Mop heads should be sent to the laundry on a daily basis.
6. After the last surgical procedure of the day or night, wet vacuum or mop the operating room floors with a single use mop or a clean mop head and an EPA-registered hospital disinfectant.
7. Do not use tacky mats at the entrance to operating rooms or delivery suites.
8. Use proper dusting methods for all patient care areas especially for immunosuppressed patients' areas.
  - a. Wet-dust horizontal surfaces daily using cloths moistened with an EPA-registered hospital disinfectant.
  - b. Avoid dusting methods that disperse dust (e.g., feather dusting).
9. Keep vacuums in good repair and keep vacuums with HEPA filters for use in high-risk patient care areas.
10. Close the doors of immunocompromised patients' rooms when vacuuming corridor floors to minimize exposure to airborne dust.
11. Take precautions when using phenolic disinfectant in neonatal units.
  - a. Prepare solutions to correct concentrations in accordance with manufacturers' instructions or use premixed formulation.
  - b. Do not use phenolics to disinfect bassinets or incubators during an infant's stay.
  - c. Rinse phenolic-treated surfaces with water.

### H. Cleaning Strategies for Spills of Blood and Body Fluids

1. Promptly clean and decontaminate spills of blood or other potentially infectious materials.
2. Follow proper procedures for site decontamination of blood and body fluid spills.
  - a. Use protective gloves and other personal protective equipment appropriate for this task.

- b. If the spill contains large amounts of blood or body fluids, clean the visible matter with disposable absorbent material, and discard the used cleaning materials in appropriate, labeled containment (red bags).
  - c. Swab the area with a disposable cloth, moderately wet with disinfectant and allow the surface to dry.
3. Use intermediate-level germicides (germicides registered by the EPA for use as hospital disinfectants and labeled tuberculocidal) at recommended dilutions and full contact time to decontaminate spills of blood and other body fluids.
4. Use a one-step cleaning/disinfecting procedure for small spills.
5. If Sodium Hypochlorite solutions (e.g. household chlorine bleach) are selected for use:
  - a. Use a 1:100 dilution (500 ppm available chlorine) to decontaminate non-porous surfaces after cleaning a spill of either blood or body fluids in patient-care settings.
  - b. If a spill involves large amounts of blood or body fluids, or if a blood or culture spill occurs in the laboratory, use a 1:10 dilution (5000 ppm available chlorine) for the first application of germicide before cleaning.

#### **I. Flowers and Plants in Patient-Care Areas**

Flowers and potted plants are not to be allowed in patient rooms of immunosuppressed patients. Some precautions for general public settings are:

1. Limiting the flower and plant care to staff with no direct patient contact
2. Advising hospital staff to wear gloves when handling plants
3. Washing hands after handling plants
4. Changing vase water every two days and discharging the water into a sink outside the immediate patient environment
5. Cleaning and disinfecting vases after use.

TITLE/DESCRIPTION: <b>PEST CONTROL</b>		INDEX NUMBER: <b>ICM – X-08</b>
EFFECTIVE DATE: <b>01/03/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To present guidelines for coordinated efforts in addressing and controlling pest-related issues that are hazardous to the environment and the workplace.

## COMMENTS

Cockroaches, flies, ants, mosquitoes, mites, mice, rats, lizards, pigeons, stray cats and dogs, and occasionally, snakes are pests that may constitute a nuisance or an infestation in healthcare facilities. Pests are agents or vectors for the mechanical transmission of disease-causing microorganisms.

Insect habitats are characterized by warmth, moisture, and availability of food. Insects forage and feed on substrates, including but not limited to food scraps from kitchens, food from vending machines, discharges on dressings, other forms of human detritus, medical wastes, human wastes, and routine solid waste.

The direct association of insects with disease transmission (apart from vector transmission) is small. However, prevention efforts are recommended.

Modern approaches to institutional pest management usually focus on:

1. Eliminating food sources, indoor habitats, and other conditions that attract pests.
2. Excluding pests from the indoor environments.
3. Applying pesticides as needed.

Pigeons can also cause serious health effects and diseases. Recommended ways to contain issues of pigeon nuisances especially in housing facilities are as follow:

1. Remove the AC units from outside to inside the housing units to prevent nesting activities.
2. Remove the decorative brown balconies to avoid the presence of pigeons around housing unit.
3. Use electrical shock on rooftops of each housing building to scare the pigeons.
4. Use available pharmaceutical anesthetic seeds such as 98% Alpha-Chloralose powder.
5. Implement an effective maintenance program on a regular basis to clean all traces of pigeon excretions in healthcare and housing facilities.

Three human diseases are known to be associated with pigeon droppings: Histoplasmosis, Cryptococcosis, and Psittacosis. Organophosphate affects the nervous system by reducing the ability of an enzyme called cholinesterase to function properly in regulating a neurotransmitter called acetylcholine. Acetylcholine helps transfer nerve impulses from a nerve cell to a muscle cell or another nerve cell. If acetylcholine is not properly controlled by cholinesterase, the nerve impulses or neurons remain active longer than they should, over stimulating the nerves and muscles and causing symptoms such as weakness or paralysis of the muscles. (See **Table 1-X-08 Pesticides**, p. 291 and **Table 2-X-08 Banned Pesticides**, pp. 292-296)

## PROCEDURES

1. Infection Prevention and Control's Occupational Health Physician checks staff working in Pest Control and using pesticides for cholinesterase level. Should results be not satisfactory, then such cases will be subject for investigation and reporting by the EHOHS.
2. The Pest Control Committee may be organized among the Support Services Director, IP&C-EHOHS staff, Pest Control Service, Housing Manager, Housekeeping Superintendent, and Pest Control Subcontractor Supervisor. The functions of this committee are as follow:
  - a. Discusses progress of pest control activities
  - b. Monitors and evaluates pest control activities
  - c. Solves problems facing pest control activities
  - d. Points out deficiencies in pest activities and recommends rectifications
  - e. Discusses and rules on contractor's discrepancies
3. Pre-foundation pest control treatment: planning and designing of facilities need to guarantee that every expansion and new project has to include pre-foundation pest control treatment that gives warranty of 20 years termite free buildings.
4. Problem areas where pest control personnel must check frequently and spray under and behind to kill the pests effectively:
  - a. *Wall-side skirting* is a possible breeding place for cockroaches.
  - b. Loose or missing door rubber gaskets are common hiding place for cockroaches.
  - c. Cabinets with closed base that are difficult to clean under where pests can hide.
  - d. Window ledges that help birds to nest and breed.

Table 1-X-08: Pesticides

Organophosphate Pesticides	
Acephate	Mevinphos
Azinphos-methyl	Monocrotophos
Bensulide	Naled
Cadusafos	Oxydemeton methyl
Chlorethoxyfos	Phorate
Chlorpyrifos	Phosalone
Chlorpyrifos methyl	Phosmet
Chlorthiophos	Phosphamidon
Coumaphos	Phostebupirim
Dialiflor	Pirimiphos methyl
Diazinon	Profenofos
Dichlorvos (DDVP)	Propetamphos
Dicrotophos	Sulfotepp
Dimethoate	Sulprofos
Dioxathion**	Temephos
Disulfoton	Terbufos
Ethion	Tetrachlorvinphos
Ethoprop	Tribufos (DEF)
Ethyl parathion	Trichlorfon
Fenamiphos	
Fenitrothion	
Fenthion	
Fonofos	
Isazophos methyl	
Isofenphos	
Malathion	
Methamidophos	
Methidathion	
Methyl parathion	

Table 2-X-08: Banned Pesticides

#	Common Name of Active Ingredient	Oral LD 50 (Rats)		Use	Reason for Banning
		Class	mg a.i./kg. Body wt		
1.	Aldrin	Class I	38-67	Insecticide	High acute mammalian toxicity, persistence in the environment, possible human carcinogen.
2.	BHC, HCH (1,2,3,4,5,6-Hexachlorocyclohexane)	Class II	-	Insecticide	Carcinogenic to animals, persistence and bioaccumulation, adverse environmental effects.
3.	Camphochlor	Class I	69	Insecticide	Risks for human and animal health and the environment, long persistence and bioaccumulation.
4.	Carbofuran	Class I, II	8	Soil Insecticide Nematicide	Acute inhalation toxicity, only liquid formulation to be banned.
5.	Chlordane	Class II	367-515	Termiticide	Carcinogenic to rodents, persistence and bioaccumulation in the environmental.
6.	Chlodrecone	Class II	114-140	Insecticide	Carcinogenic to rodents, persistence and bioaccumulation in the environmental.
7.	DDT (Dichloro-Diphey trichloroethane)	Class III	113	Insecticide	Accumulation in humans, probably carcinogenic, persistence in the environment.
8.	Demetion-O + Demetion-S	Class I	2.5-6	Systemic Insecticide	High acute toxicity for man and animals.
9.	Demetion-S-methyl	Class I	30	Systemic Insecticide	High acute toxicity for man and animals
10.	Dichlorovos	Class I	50	Insecticide	Not acceptable in public health formulations for use inside houses and other structures because of its probable carcinogenic and mutagenic effect, may only be used in small percentages in tablets or strips for insect pheromone traps.
11.	Dieldrin	Class I	37-87	Insecticide	Persistence in the environmental.
12.	Disulfoton	Class I	4	Sys. Insect/ Acaricide	High acute toxicity.
13.	Endosulfan	Class I	22.7-160	Insecticide	High acute toxicity, high persistence and potential for bioaccumulation.
14.	Endrin	Class I	7-15	Insecticide	High acute toxicity, Central Nervous System Depressant and hepatotoxin, no antidote.
15.	Ethyl Pyrophosphate (TEPP)	Class I	1.2-2	Insecticide	Very high acute toxicity to man ns animal, quickly absorbed through the skin, its vapors highly toxic.

#	Common Name of Active Ingredient	Oral LD 50 (Rats)		Use	Reason for Banning
		Class	mg a.i./kg. Body wt		
16.	Flueythrinate	Class I	67	Insecticide	Causes damage to the eye, very toxic by oral route and absorption through the skin, harmful if inhaled, causes carcinogenic effects to humans.
17.	Gamma HCH	Class II	88- 125	Insecticide	Persistence in the environment, Bioaccumulation in food and the human body, probably carcinogenic to man and there is evidence that it encourages the growth of tumors caused by other factors.
18.	Heptachlor	Class II	147-220	Termiticide	Carcinogenic to rodents, persistence and environment contamination.
19.	Kelevan	-	-	Insecticide	Superseded
20.	Leptophos	Class II	52.8	Insecticide	High acute toxicity, delayed neurotoxicity to humans and to laboratory animals.
21.	Methamidophos	Class I	30	Insecticide	Highly toxic to mammals, there could always be health problems in misuse.
22.	Methomyl	Class I	17-24	Insecticide	Highly toxic to man and animals, all formulations to be banned.
23.	Methoxychlor	Class IV	6000	Insecticide	Long residual action (long persistence), bioaccumulation.
24.	Mevinphos	Class I	3-12	Systemic Insecticide	Poisonous if swallowed, inhaled or absorbed through the skin.
25.	Mirex	Class II	306	Insecticide	Persistence and bioaccumulation in food, superseded.
26.	Monocrotophos	Class I	14	Systemic Insecticide	High acute toxicity by oral, dermal and inhalation routes causing life-threatening symptoms.
27.	Oxamyl	Class I	5.4	Soil Insecticide/ Nematicide	Very high acute oral toxicity.
28.	Oxydemeton-methyl	Class I	65-80	Systemic Insecticide	Highly toxic to man and animals.
29.	Oxydeprofos	Class II	100	Systemic Insecticide	Highly toxic to man and animals.
30.	Parathion	Class I	6	Insecticide	High acute toxicity by oral, dermal and inhalation routes causing life-threatening symptoms, classified as class C carcinogen.
31.	Parathion-methyl	Class I	6	Insecticide	Very high acute toxicity.
32.	Phosphamidon	Class I	17-30	Systemic Insecticide	Poisonous if swallowed, inhaled or absorbed through the skin.

#	Common Name of Active Ingredient	Oral LD 50 (Rats)		Use	Reason for Banning
		Class	mg a.i./kg. Body wt		
33.	Schradan	-	-	Systemic Insecticide	Poisonous if swallowed, inhaled or absorbed through the skin-superseded.
34.	Sodium Floride	Class II	180	Insecticide	Very toxic to mammals and highly phytotoxic, used in insect baits and for timber preservation.
35.	Strobane	Class II	220	Insecticide	Carcinogenic risk for humans, discontinued by manufacturing company.
36.	Telodrin	-	-	Insecticide	Superseded
37.	Chlordimeform	Class II	340	Acaricide	Probably human carcinogen.
38.	Chlorobenzilate	Class III	2.784-3.880	Acaricide	A risk of cancer to human's males.
39.	Cyhexaine	Class III	540	Acaricide	Tetratogenic effects in mammals.
40	Dicofol	Class II, III	570-595	Acaricide	Potential bioaccumulation combined with persistence in the environment, may contain DDT as a contaminant (in the manufacturing process).
41.	Benomyl	Class IV	10.000	Systemic fungicide	Evidence of genetic disturbances and fetal defects, increase of tumor growth formed in laboratory mice by other factors.
42.	Captafol	Class IV	5000-6000	Fungicide	Probably carcinogenic to humans.
43.	Chlorothalonil	Class I, II	10.000	Fungicide	Chronic administration has been associated with tumor formation in the kidney and fore stomach of laboratory rats and mice.
44.	Hexachlorobenzene (HCB)	Class IV	40.000	Fungicide (seed dressing)	Carcinogenic to laboratory animals, persistence and bioaccumulation.
45.	Mancozeb	Class IV	5000	Fungicide	At high levels may cause birth defects in test animals, a trace contaminant and a degradation product (ethylenethiourea) causes thyroid effects, tumors and birth defects in laboratory animals, moreover, this fungicide has long withholding periods of about one month.
46.	Maneb	Class IV	7990	Fungicide	At high levels may cause birth defects in test animals, a trace contaminant and a degradation product (ethylenethiourea) causes thyrodeffects, tumors and birth defects in laboratory animals.

#	Common Name of Active Ingredient	Oral LD 50 (Rats)		Use	Reason for Banning
		Class	mg a.i./kg. Body wt		
47.	Mercury Compounds (e.g. Phenyl mercury acetate)	Class I	50-100	Fungicide & Herbicide	High acute toxicity, accumulation of residues in aquatic foods.
48.	Thiram	Class III	1000	Fungicide	Combination of several severe chronic toxicity effects.
49.	Zineb	Class IV	-	Fungicide	At high levels may cause birth defects in test animals, a trace contaminant and a degradation product (ethylenethiourea) causes thyrodeffects, tumors and birth defects in laboratory animals.
50.	Ziram	Class I	1000	Fungicide	Combination of several severe chronic toxicity effects.
51.	Amitrole, Aminotriple	Class III	5000	Herbicide	Risk of carcinogenic effects in humans.
52.	Atrazine	Class III	1869-3080	Herbicide	Possible carcinogenic effects in humans.
53.	Cyanazine	Class II	182-380	Herbicide	Possible carcinogenic effects in humans.
54.	Dinoseb	Class I	40-60	Herbicide	High acute toxicity, teratogenic and carcinogenic effects, many cause sterility to human males.
55.	Dinoseb Salts (e.g. Dinoseb Acetate)	Class I	40-60	Herbicide	High acute toxicity, teratogenic and carcinogenic effects, many cause sterility to human males.
56.	Nitrofen	Class III	2630	Herbicide	Risks of mutagenic, teratogenic and carcinogenic effects.
57.	Paraquat	Class II	150	Herbicide	High acute toxicity, no antidote.
58.	Simazine	Class IV	5000	Herbicide	Possible carcinogenic effects to humans.
59.	2,4,5-T (2,4,5-trichlorophenoxy acetic acid)	Class III	500	Herbicide	Possible teratogenic, carcinogenic effects to humans, long persistence and bio-accumulation
60.	Arsenic Compounds	-	-	Rodenticide	High acute toxicity, exceptions are the organic arsenicals, which are of low toxicity, used as selective herbicides.
61.	Fluoroacetamide	Class I	15	Rodenticide	High acute toxicity to man and other animals.
62.	Sodium Fluoroacetate	Class I	0.22	Rodenticide	Odorless, tasteless and fast acting, chiefly in the heart. Discontinued by the manufacturing company.
63.	Thallium Sulfate	Class I	16	Rodenticide	High acute toxicity, slow-acting cumulative poison.
64.	Zinc Phosphide	Class I	45.7	Rodenticide	High acute toxicity in all handling operations.
65.	Aldicarb	Class I	1	Sys. Insecticide / Nematocide	High acute toxicity.

#	Common Name of Active Ingredient	Oral LD 50 (Rats)		Use	Reason for Banning
		Class	mg a.i./kg. Body wt		
66.	Chloropicrin	Class I	250		Highly toxic by inhalation, and toxic by ingestion, can injury to the heart.
67.	Dibromochloropropane (DBCP)	Class I	17-300	Soil Sterilant	May cause sterility to human males.
68.	Ethylene dibromide (EDB)	Class I	146	Soil Sterilant	Potential carcinogen to humans may cause sterility to males, persistence in ground water.
69.	Pentachlorophenol (PCP)	Class I	50-500		Adverse liver and kidney effects, possible carcinogenic to humans.

TITLE/DESCRIPTION: <b>INFECTION PREVENTION AND CONTROL PROCEDURES FOR HOSPITAL AND HEALTHCARE FACILITY CONSTRUCTION AND RENOVATION</b>		INDEX NUMBER: <b>ICM – X-09</b>
EFFECTIVE DATE: <b>01/01/2009 01/01/2013</b>	APPLIES TO: <b>All GCC Countries</b>	ISSUING AUTHORITY: <b>GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)</b>

## DEFINITION

To ensure that infection control risk assessment, interventions, and control practices are incorporated into the planning, construction, and renovation in the healthcare setting, by defining the steps and precautions compliant to Infection Prevention & Control procedures to eliminate infection hazards that pose danger to personnel and patients of all healthcare setting.

## COMMENTS

1. This policy applies to all construction/renovation works within and outside any hospital or healthcare facilities, which include preventive maintenance on heating, ventilation and air conditioning (HVAC) system, ventilator cleaning, filter replacement, etc. that may compromise and/or contaminate air and water supply.
2. Healthcare associated infections are caused by pathogens like Mycobacterium tuberculosis, Aspergillus species, Legionella species present in the dust and debris generated by construction activities. These are considered as major hazards.
3. The Infection Prevention and Control Department will be involved and pre-informed of all current and future construction activities at the Healthcare facilities. Infection Prevention and Control personnel will be active team members in all phases of any construction/renovation projects where they will play a major role in providing education to workers and staff involved in the project to ensure that preventive measures are outlined, implemented, and maintained.
4. An established multidisciplinary team composed of Infection Control, Environmental Risk assessment, Safety and Engineering, is responsible in planning, implementing preventive measures for the duration of the construction project and in establishing clear lines of communication among all concerned to ensure patient safety.

## REFERENCES

1. American Institute of Architects, Academy of Architecture for Health, Guidelines for Design & Construction of Healthcare Facilities (2006).
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3. Association of Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 106: Construction and renovation. In APIC *Text of infection control and epidemiology* (3<sup>rd</sup> ed.)
4. Center for Disease Control (CDC) (2001). Guidelines for environmental infection control in healthcare facilities.
5. Center for Disease Control (CDC) and Healthcare Infection Control Practices Advisory Committee (HICPAC) (2003). Guidelines for environmental infection control in healthcare facilities.

6. Construction related Nosocomial infections for hospital patients: decreasing the risk of *Aspergillosis*, *Legionella* and other infections (2001). Laboratory Center for Disease Control (LCDC) Health Canada in Healthcare Facilities.
7. Infection Control and Hospital Epidemiology (1997). Vol. 18 No. 8, pages 587- 596.
8. Joint Commission International Hospital Accreditation Standards (2008). 3<sup>rd</sup> Edition.
9. Laboratory Center for Disease Control (LCDC) Health Canada (1996). Division of Nosocomial and Occupational Infections: Decreasing the risk of construction-related nosocomial infections for hospitalized patients.

## **RESPONSIBILITIES**

1. The Infection Prevention and Control (IP&C) Department will be involved and pre-informed of all current and future construction activities in any healthcare facilities. IP&C personnel will be active team members in all phases of any construction / renovation projects where they will play a major role in providing education to workers and staff involved in the project to ensure that preventive measures are outlined, implemented, and maintained.
2. The Project Management Department will establish a multidisciplinary team primarily composed of the IP&C Environmental Health Specialists and the Engineering Department to coordinate demolition, construction, and renovation projects and to consider proactive preventive measures at the project inception.
3. The established multidisciplinary team is responsible for planning and implementing preventive measures for the duration of the construction project and for establishing clear lines of communication among all concerned parties to ensure patient safety.
4. The IP&C Environmental Health and Occupational Health and Safety (EHOHS) section has the authority to stop construction projects if prevention measures were breached that may expose patients and personnel to infection and environmental hazards.

## **PROCEDURE**

### **A. Pre-Construction Preventive Measures**

1. The multidisciplinary team should include representatives from all concerned departments. All parties must agree on the multidisciplinary action plan.
2. Seasonal effects related to infections should be considered in the work plan for projects.
3. An *Infection Control Risk Assessment Form: Construction Permit* ([Appendix 1-X-09](#) pp. 302-303) must be filled and signed before starting any construction project.
4. IP&C should be consulted to provide information on the following Infection and Environmental Control Risk Assessment, Matrix of Precautions for Construction and Renovation.
  - a. Infection Control Practitioner or Environmental Health Specialist will identify the type of construction project activity using [Appendix 2-X-09](#) *Determining the Type of Construction / Renovation*, p. 304.
  - b. Using [Appendix 3-X-09](#) (*Determining the Patient Risk groups that will be Affected by the Construction / Renovation*, p. 305) the Infection Control Practitioner will identify the Patient Risk Groups that will be affected.
  - c. The Infection Control Practitioner or Environmental Health Specialist will match the Patient Risk Group with the Construction Project Type on the following matrix, to find the Class of Precautions or level of Infection and Environmental Control activities required ([Appendix 4-X-09](#) *Description of the Required Precautions by Class*, pp. 306-307).

5. IP&C approval will be required when the Construction Activity and Risk Level indicate that Class III or Class IV control procedures are necessary.
6. The Infection Control Practitioner is responsible for:
  - a. Identifying all the areas surrounding the project and assess the potential hazards.
  - b. Identifying the specific site of activity e.g., patient rooms, medication room, etc.
  - c. Assessing whether the plans allow for:
    - i. An adequate number of isolation / negative airflow rooms
    - ii. The required number and type of hand washing sinks
  - d. Assessing whether the minimum number of sinks for the project is available based on the AIA Guidelines for types and area.
  - e. Assessing whether the plans relative to clean and soiled utility rooms are compliant.
7. The Environmental Health Specialist is responsible for:
  - a. Identifying issues related to ventilation, plumbing, and electrical viz. the probable occurrence of outages.
  - b. Identifying containment measures using prior assessment such as, types of barriers (solid wall) and the need for Hepa filtration.
 

**Note:** The renovation / construction area must be isolated from the occupied areas during construction and will be negative with respect to surrounding areas.
  - c. Assessing potential risk of water damage and risks due to compromising structural integrity e.g., wall, ceiling, roof.
  - d. Deciding work hours for the project and assessing whether the work can be done during non-patient care hours.
  - e. Planning to discuss the containment issues with the project team, e.g., traffic flow, housekeeping, debris removal (how and when).
8. All contracted construction workers must be aware of the health and safety risks to staff and patients during construction / renovation activities. It is the responsibility of the construction team to comply with the provisions of this policy as outlined by the IP&C department.
9. The responsible engineering party will:
  - a. Establish traffic patterns for construction workers that will avoid patient care areas.
  - b. If possible, designate an elevator to be used solely by the construction workers and ensure that the ventilation of the elevator cab and shaft is not re-circulated in the hospital.
  - c. Establish a mechanism to ensure timely correction of problems.

## **B. During Construction Preventive Measures**

1. The ward is responsible for addressing the needs of immunocompromised patients. They should be moved to an area away from the construction zone if the air quality cannot be assured during construction. These patients should wear a mask if it is necessary to transport them through or near the construction area.
2. The responsible engineering party must ensure that:
  - a. All windows, doors, air intake and exhaust vents are sealed in areas of the hospital adjacent to buildings that are going to be demolished including areas housing patients who are susceptible, to prevent air leaks into patient care areas.
  - b. A dust barrier is created from the floor to the ceiling with the edges sealed. Plastic (for short-term projects) or sheetrock (for long-term projects) are examples of materials that can be used to seal the construction area.
  - c. All windows, doors, vents, plumbing penetrations, electrical outlets and any other sources of potential air leak are sealed in the construction zone. Seal all holes, pipes, conduits and punctures appropriately.
  - d. Air pressure within the construction zone is negative compared with adjacent areas. A fan may be used for this purpose with a HEPA filtered exhaust.

- e. Air in the construction zone is exhausted directly outside. If this is not possible, then the air should be filtered through a HEPA filter before being re-circulated in the hospital. The integrity of the HEPA filter should be assessed to ensure that it is not punctured or blocked.
  - f. Open ends of exhaust vents are capped to prevent air exhausted from the construction zone, from being drawn into the facility's air supply.
  - g. Air ducts and spaces above ceiling are vacuumed before the construction project is started in the involved areas and repeated before utilization of the area to ensure sufficient functioning. The mechanical or electrical fixtures must be cleaned before installation of ceiling tiles.
  - h. Work surfaces are water misted to control dust while cutting concrete wall or floor.
  - i. A moist carpet to trap dust is placed inside the anteroom and inside the entrance and exit of the construction zone. The carpet should be vacuumed daily or when visibly soiled.
  - j. A mat with a sticky surface is placed directly outside the impermeable barrier (anteroom), to trap dust from the equipment and shoes of personnel leaving the construction zone. Change mat on daily basis.
  - k. The construction zone is cleaned daily using a wet mop technique.
  - l. Used supplies and equipment are enclosed in covered containers when being transported out of the area to prevent spillage.
  - m. Debris is removed by the construction workers at a period of low activity in the hospital i.e., in the evening when patients are in their rooms and visitors have left. If this is not possible, debris should be removed at the end of the workday by construction workers. Debris should be in tightly covered containers / carts or covered with moistened sheets before it is removed from the construction area.
  - n. An external chute is used if necessary for removal of debris if construction is not taking place on ground level.
  - o. Faucet aerators and other obstructing and stagnating features (e.g. long pipes and plumbing dead-ends) are removed if possible.
  - p. Dust suppression is maintained in outdoor construction sites.
  - q. Copper-8-quinolinolate formulation is considered for application to walls, doors, frames, baseboards, exterior surfaces of radiators, vents in the rooms in the construction area and above false ceilings in adjacent areas.
  - r. Installation of cleaned ceiling tiles is secured with silicone sealant.
  - s. The partition floor track is clean prior to installation of sound insulation and closing of partition.
3. All departments are responsible for reporting any discoloration of water promptly to maintenance and infection control personnel. Alternate water sources should be considered for patient use.
  4. Construction workers should wear protective clothing when working in the construction zone because of the high concentration of dust. To limit dust dispersion, if there is no external non-patient area exit, construction workers must remove the protective clothing and vacuum to remove the dust from their clothing before leaving the construction zone. The supplier of the HEPA filtered vacuum should indicate this provision in the contract document or they can wear clothes or paper coveralls that are removed each time they leave the work site.
  5. All personnel entering work site are required to wear shoe covers. Shoe covers must be removed each time the worker exits the work area.
  6. Infection Control Practitioner / Environmental Health Specialist personnel should regularly (weekly) visit the construction site until the project is completed to ensure that preventive measures are being adhered to or that appropriate modifications are made if there is any onsite design changes. If any concerns are identified, they should be brought to the attention of the responsible Engineering party and to the Infection Prevention & Control Director.

7. Housekeeping are responsible for ensuring that adjacent areas are vacuumed daily or more frequently if needed with HEPA filtered vacuums.
8. Engineering in coordination with IP&C-EHOHS are responsible for ensuring adequate signage.

### C. Post Construction Preventive Measures

1. The responsible Engineering party should:
  - a. Thoroughly clean the construction zone, including all horizontal surfaces, before the barrier is removed, and again after the barrier is removed and before patients are readmitted to the area. Allow time for all dust to settle before doing final cleaning.
  - b. Ensure that the multidisciplinary team or designate conducts a final walk through to ensure ventilation system is functioning properly in construction zone and adjacent areas.
  - c. Flush water lines prior to use if they were disrupted.
  - d. If there are concerns about *Legionella* and *Aspergillus*, consider hyper-chlorinating stagnant potable water or superheating and flushing all distal sites before restoring or repressurizing the water system.
  - e. Disinfect unused cooling towers and water supply in unoccupied portions of buildings before they are put in use.
  - f. Assess hot water temperature to determine that it meets the standards set by the hospital.
  - g. Ensure that the multidisciplinary team or designate evaluates the preventive measures and reviews their effectiveness for any problems to ensure a positive outcome.
  - h. Balance the air.
2. Infection and Environmental control personnel should check the area before patients are readmitted to the finished area and before removing or allowing the removal of the barrier. A fungal air sample will be taken if required.
3. Housekeeping should clean the area thoroughly including vacuuming the work area with HEPA filtered vacuums.

**Appendix 1-X-09:  
Infection Control Risk Assessment Permit Form - Construction Permit**

Location of Construction: _____ Project Coordinator: _____ ID#: _____ Contractor Performing Work: _____ Supervisor: _____ ID#: _____ Pager #: _____	Project Start Date: _____ Estimated Duration: _____ Permit Expiration Date: _____ Tel. Ext.: _____ Mobile #: _____
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YES	NO	CONSTRUCTION ACTIVITY	YES	NO	INFECTION CONTROL RISK GROUP
		<b>Type A:</b> Inspection, non-invasive activity			<b>Group 1:</b> Low Risk
		<b>Type B:</b> Small scale, short duration, moderate to high level of dust.			<b>Group 2:</b> Medium Risk
		<b>Type C:</b> Activity generates moderate to high levels of dust and/ or noise requires greater work shift for completion			<b>Group 3:</b> Medium / High Risk
		<b>Type D:</b> Major duration and construction activities requiring consecutive work shifts			<b>Group 4:</b> Highest Risk

<b>CLASS I</b>	<ol style="list-style-type: none"> <li>1. Executive work by methods to minimize raising dust from construction operations.</li> <li>2. Immediate replace any ceiling tile displaced for visual inspection.</li> <li>3. Minor demolition for remodeling.</li> <li>4. Provide MSDS for paint and disinfectants prior to use.</li> </ol>
<b>CLASS II</b>	<ol style="list-style-type: none"> <li>1. Provide active means to prevent air-borne dust from dispersing into atmosphere.</li> <li>2. Water mist work surfaces to control dust while cutting.</li> <li>3. Seal unused doors with duct tape</li> <li>4. Block off and seal air vents.</li> <li>5. Wipe surfaces with disinfectant.</li> <li>6. Contain construction waste before transport in tightly covered containers. Choose low traffic and route.</li> <li>7. Wet mop and / or vacuum with HEPA filtered vacuum before leaving work area.</li> <li>8. Place dust mat at entrance and exit of work area</li> <li>9. Remove or isolate HVAC system in areas where work is being performed.</li> <li>10. Provide MSDS for paint and disinfectants prior to use.</li> </ol>
<b>CLASS III</b>	<ol style="list-style-type: none"> <li>1. Obtain Infection Control permit before construction begins.</li> <li>2. Isolate HVAC system in area where work is being done to prevent contamination of the duct system</li> <li>3. Complete all critical barriers or implement control cube method before construction begins.</li> <li>4. Maintain negative air pressure within work site.</li> <li>5. Do not remove barriers from work area until complete.</li> <li>6. Vacuum work with HEPA filtered vacuums.</li> <li>7. Wet mop with disinfectant.</li> <li>8. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction.</li> </ol>

	<ol style="list-style-type: none"> <li>9. Contain construction waste before transport in tightly covered containers. Choose low traffic and route.</li> <li>10. Cover transport receptacles or carts. Tape covering.</li> <li>11. Remove or isolate HVAC system in areas where work is being performed.</li> <li>12. Provide MSDS for paint and disinfectants prior to use.</li> </ol>
<b>CLASS IV</b>	<ol style="list-style-type: none"> <li>1. Obtain Infection Control permit before construction begins.</li> <li>2. Isolate HVAC system in area where work is being done to prevent contamination of duct system.</li> <li>3. Complete all critical barriers or implement control cube method before construction begins.</li> <li>4. Maintain negative air pressure within work site.</li> <li>5. Seal holes, pipes, conduits, and punctures appropriately.</li> <li>6. Construction anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site.</li> <li>7. All personnel entering work site are required to wear shoe covers.</li> <li>8. Do not remove barriers fro work area until completed project is thoroughly cleaned by the Environmental Services Department.</li> <li>9. Vacuum work area with HEPA filtered vacuums.</li> <li>10. Wet mop with disinfectant.</li> <li>11. Remove barrier</li> </ol>

<b>Additional Requirements: Noise Level Acceptable</b>	Yes	No	Not Acceptable
<b>Engineering Department:</b>	<b>Infection Control &amp; Environmental Health &amp; Safety:</b>		
Permit Requested by:	Permit Authorized by:		
Date:	Date:		
Release for occupancy by:	Exceptions / Additions to this permit:		
Date:	Date:		

**Appendix 2-X-09:  
Determining the Type of Construction / Renovation**

<p><b>Type A Level I</b></p>	<p>Inspection and non-invasive activities including, but not limited to:</p> <ul style="list-style-type: none"> <li>▪ Removal of ceiling tiles for visual inspection limited to tile per 50 square feet</li> <li>▪ Painting (but no sanding)</li> <li>▪ Wall covering, electrical trim work, minor plumbing, and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection</li> </ul>
<p><b>Type B Level II</b></p>	<p>Small scale, short duration activities which create minimal dust including, but not limited to:</p> <ul style="list-style-type: none"> <li>▪ Installation of telephone and computer cabling</li> <li>▪ Access to close spaces</li> <li>▪ Cutting of walls or ceiling where dust migration can be controlled</li> </ul>
<p><b>Type C Level III</b></p>	<p>Work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies including, but not limited to:</p> <ul style="list-style-type: none"> <li>▪ Sanding of walls for painting or wall covering</li> <li>▪ Removal of floor covering, ceiling tiles and caseworks</li> <li>▪ New wall construction</li> <li>▪ Minor duct work or electrical work above ceilings</li> <li>▪ Major cabling activities</li> <li>▪ Any activity which cannot be completed within a single work shift</li> <li>▪ Painting in medium and high risk areas</li> <li>▪ Moderate to high level of noise (e.g., cutting steel)</li> </ul>
<p><b>Type D Level IV</b></p>	<p>Major demolition and construction projects including, but not limited to:</p> <ul style="list-style-type: none"> <li>▪ Activities which require consecutive work shifts</li> <li>▪ Requires heavy demolition or removal of a complete cabling system</li> <li>▪ New construction</li> </ul>

**Appendix 3–X-09:  
Determining Patient Risk Groups that will be Affected  
by the Construction / Renovation**

<p><b>Group 1 Low Risk</b></p>	<ul style="list-style-type: none"> <li>▪ Office areas</li> <li>▪ Non-patient areas</li> </ul>
<p><b>Group 2 Medium Risk</b></p>	<ul style="list-style-type: none"> <li>▪ Patient areas not listed in Groups 3 or 4</li> <li>▪ Materials management</li> <li>▪ Physical therapy / occupational therapy / speech therapy</li> <li>▪ Admission / discharge</li> <li>▪ Public corridors (through which patients and supplies pass by)</li> <li>▪ Laboratories not specified in Group 3</li> <li>▪ Echocardiography</li> <li>▪ Nuclear medicine</li> <li>▪ MRI</li> <li>▪ Respiratory therapy</li> <li>▪ Cafeteria</li> <li>▪ Dietary</li> </ul>
<p><b>Group 3 High Risk</b></p>	<ul style="list-style-type: none"> <li>▪ Critical care units (CCU)</li> <li>▪ Emergency room</li> <li>▪ Radiology</li> <li>▪ Labor and delivery</li> <li>▪ Microbiology / radiology laboratories</li> <li>▪ Intensive care units (ICU)</li> <li>▪ Intermediate care nursery</li> <li>▪ Newborn nursery</li> <li>▪ Long term / sub-acute units</li> <li>▪ Dialysis</li> <li>▪ Endoscopy</li> <li>▪ Outpatient surgery</li> <li>▪ Pediatrics</li> <li>▪ Pharmacy</li> <li>▪ Post-anesthesia care unit</li> <li>▪ Surgical units</li> </ul>
<p><b>Group 4 Highest Risk</b></p>	<ul style="list-style-type: none"> <li>▪ Any area caring for immunocompromised patients</li> <li>▪ Burn unit</li> <li>▪ Cardiovascular intensive care unit (CVICU)</li> <li>▪ Catheterization</li> <li>▪ Angiography areas</li> <li>▪ Central sterile supply / processing areas</li> <li>▪ Pharmacy admixture</li> <li>▪ Negative pressure isolation rooms</li> <li>▪ Oncology</li> <li>▪ Radiology oncology suite</li> <li>▪ Anesthesia and pump areas</li> <li>▪ Operating rooms</li> </ul>

**Appendix 4–X-09:  
Description of the Required Precautions by Class**

	<b>During Construction Project</b>	<b>Upon Completion of Project</b>
<b>CLASS I</b>	<ol style="list-style-type: none"> <li>1. Executive work by methods to minimize raising dust from construction operations.</li> <li>2. Immediately replace a ceiling tile displaced for visual inspection.</li> <li>3. Provide MSDS for paint and disinfectants prior to use.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean work area upon completion of task.</li> </ol>
<b>CLASS II</b>	<ol style="list-style-type: none"> <li>1. Provide active means to prevent airborne dust from dispersing into the atmosphere.</li> <li>2. Water mist work surfaces to control dust while cutting.</li> <li>3. Seal unused doors with duct tape.</li> <li>4. Block off and seal air vents.</li> <li>5. Place dust mat at entrance and exit of work area.</li> <li>6. Remove or isolate HVAC system in areas where work is being performed.</li> <li>7. Provide MSDS for paint and disinfectants prior to use.</li> </ol>	<ol style="list-style-type: none"> <li>1. Wipe work surfaces with hospital approved disinfectant.</li> <li>2. Contain construction waste before transport in tightly covered containers. Choose low traffic time and route.</li> <li>3. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area.</li> <li>4. Remove isolation of HVAC system in areas where work has been performed.</li> </ol>
<b>CLASS III</b>	<ol style="list-style-type: none"> <li>1. Remove or isolate HVAC system in areas where work is being done to prevent contamination of duct system.</li> <li>2. Complete all critical barriers such as sheetrock, plywood, plastic to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins.</li> <li>3. Maintain negative air pressure within work site.</li> <li>4. Contain construction waste before transport in tightly covered containers. Choose low traffic time and route.</li> <li>5. Cover transport receptacles or carts. Tape covering unless solid lid.</li> <li>6. Provide MSDS for paint and disinfectants prior to use.</li> </ol>	<ol style="list-style-type: none"> <li>1. Do not remove barriers from work area until project is completed and duly inspected by IP&amp;C-EHOHS, as well as, thoroughly cleaned by the construction workers and the Environmental Services department.</li> <li>2. Remove barrier materials carefully to minimize spread of dirt and debris as a result of construction activities.</li> <li>3. Vacuum work area with HEPA filtered vacuums.</li> <li>4. Use wet mop with disinfectant.</li> <li>5. Remove isolation of HVAC system in areas where work has been performed.</li> </ol>

<b>CLASS IV</b>	<ol style="list-style-type: none"> <li>1. Isolate HVAC system in area where work is being done to prevent contamination of duct system.</li> <li>2. Complete all critical barriers such as sheetrock, plywood, plastic to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins.</li> <li>3. Maintain negative air pressure within work site.</li> <li>4. Seal holes, pipes, conduits, and punctures appropriately.</li> <li>5. Construct anteroom and require all personnel to pass through this room which can be vacuumed with HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site.</li> <li>6. All personnel entering the work site are required to wear shoe covers. Shoe covers must be changed each time the work exits the work area.</li> <li>7. Do not remove barriers from work area until project is completed and inspected by the IP&amp;C-EHOHS and thoroughly cleaned by the Environmental Services department.</li> <li>8. Provide MSDS for paint and disinfectants prior to use.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove barrier materials carefully to minimize spread of dirt and debris as a result of construction activities.</li> <li>2. Contain construction waste before transport in tightly covered containers.</li> <li>3. Cover transport receptacles or carts. Tape covering unless solid lid.</li> <li>4. Vacuum work area with HEPA filtered vacuums.</li> <li>5. Use wet mop with disinfectant.</li> <li>6. Remove isolation of HVAC system in areas where work has been performed.</li> </ol>
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