



<b>Department:</b>	Infection Prevention and Control Department		
<b>Document:</b>	Multidisciplinary Policy and Procedure (MPP)		
<b>Title:</b>	Intensive Care Units (ICUs) IPC Guidelines		
<b>Applies To:</b>	ICUs Department (NICU, PICU, MICU)		
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## 1. PURPOSE:

1.1 To provide evidence-based infection control guidelines to ensure the safety of patients & Health Care workers (HCWs) in the ICU

## 2. DEFINITONS:

2.1 Intensive care units (ICUs) are specialist hospital wards that provide treatment and monitoring for people who are very ill.

## 3. POLICY:

3.1 ICU staff must use the standard precaution for all patients, even in the absence of a suspected or confirmed infectious process

3.2 Routine screening for all ICU newly admitted or transferred patients to identify those who require isolations precautions. MDROs screening must be done from specific body sites known to be associated with colonization by a specific microorganisms such as:

- 3.2.1 Methicillin-Resistant Staphylococcus Aureus (MRSA): Nares, axilla, groins area.
- 3.2.2 Vancomycin-Resistant Enterococcus (VRE): Rectal swab or perianal swab, Wounds and catheter exit sites.
- 3.2.3 Carbapenem-Resistant Enterobacteriaceae (CRE): Stool sample or rectal swab.
- 3.2.4 Extended Spectrum Beta-Lactamase (ESBL): Stool sample or rectal swab.
- 3.2.5 Acinetobacter: Nostrils, pharynx and skin surface
- 3.2.6 Candida Auris: bilateral axilla and groin.
- 3.2.7 Other laboratory test: Blood culture, blood group, CBC, CRP and Chemistry or other laboratory investigation as per patient condition.

## 4. PROCEDURE:

4.1 Intensive Care Unit Design

4.1.1 Spacing in the Intensive Care Units:

- 4.1.1.1 Separate rooms or cubicles for single patient use shall be no less than 150 square feet(13.94 square meters)
- 4.1.1.2 Multiple bed spaces shall contain at least 130 square feet (12.08 square meters) per bed.

4.1.2 Hand-Washing Stations:

- 4.1.2.1 There should be at least one hands-free handwashing sink for every 2- 4 beds in the ICU.
- 4.1.2.2 There should be one hands-free handwashing sink per patient's room.
- 4.1.2.3 The handwashing station should be located near the entrance to the patient cubicle, or room

- 4.1.2.4 The handwashing station should be sized to minimize splashing water onto the floor
- 4.1.2.5 The handwashing station should be equipped with hands-free operable controls.
- 4.1.3 Airborne Infection Isolation Room (AIIR):
  - 4.1.3.1 ICU should have at least one airborne infection isolation room for each 8 beds
  - 4.1.3.2 ICU AIIR should be compatible with the approved requirements and specifications with the exception that there is no need for a separate toilet, bathtub, or shower.
- 4.1.4 Medical store
  - 4.1.4.1 The intensive care unit must have separated medical storage areas with adequate capacity.
  - 4.1.4.2 Medical storage areas have controlled ventilation with adjusted temperature and humidity (temperature ranges from 22 °C to 24 °C /relative humidity up to 70%).
  - 4.1.4.3 Storage shelves are at least, 40 cm from the ceiling, 20 cm from the floor, and 5 cm from the wall.
  - 4.1.4.4 Storage shelves are made of easily cleanable material.
  - 4.1.4.5 Sterile and clean items are completely separated from personal items.
  - 4.1.4.6 No items are kept in the original shipping boxes, especially in the clinical area.
- 4.1.5 Medication Preparation Area / Room:
  - 4.1.5.1 Intensive care unit must have separated clean area maintained for preparation of medications
  - 4.1.5.2 Medication preparation area must be away from patients' treatment areas

**4.2 Prevention Strategies in ICUs:**

- Staffing ● Staff immunization ● Staff training ● Standard precaution
- Isolation precautions ● Aseptic technique ● Multidrug-Resistant Organisms (MDROs) management
- Prevention of device-associated infections ● Antimicrobial Stewardship

**4.2.1 Staffing:** Nurse – to patient ratio must be (1:1 or 1:2) maximum.

**4.2.2 Staff vaccination:** all HCW must receive the following vaccinations

- 4.2.2.1 Hepatitis B Vaccine
- 4.2.2.2 MMR (Measles, Mumps, Rubella) Vaccine for HCW without serologic evidence of immunity or prior vaccination (Documented immunity)
- 4.2.2.3 Varicella(Chickenpox) vaccine for HCW who have no serologic proof of immunity, prior vaccination or history of varicella disease (Documented immunity)
- 4.2.2.4 Tdap (tetanus, diphtheria & pertussis) vaccine for HCW without documented immunity.
- 4.2.2.5 Meningococcal vaccine
- 4.2.2.6 Influenza vaccine annually
- 4.2.2.7 COVID -19 vaccine (2 Doses)

**4.2.3 Staff Training:**

- 4.2.3.1 All HCW in the intensive care unit must have pre-employment training and education on the basics of infection control.
- 4.2.3.2 All HCW in the intensive care unit must receive job-specific infection control training & education according to the nature of work.
- 4.2.3.3 Training must undergo yearly competency assessments to ensure HCWs are competent enough to perform their assigned duties and skills.
- 4.2.3.4 IC Training program must incorporate basic & specialized training for ICU staff. (Hand hygiene, environmental cleaning and disinfection, and use of personal protective

equipment, aseptic technique and special care in the intensive care unit etc.)

4.2.4 **Standard Precautions:**

- 4.2.4.1 Standard precautions are the first step in breaking the cycle of infection and preventing the transmission of microorganisms
- 4.2.4.2 Standard precautions are utilized to protect both healthcare personnel and patients.

4.3 Standard Precautions Elements:

4.3.1 Hand Hygiene:

- 4.3.1.1 Hand hygiene involves antibacterial soap and water or alcohol-based hand rub and used to remove or kill microorganisms that colonize the hands.
- 4.3.1.2 Types of Hand Hygiene:
  - 4.3.1.2.1 Simple handwashing: Washing hands with soap and water.
  - 4.3.1.2.2 Antiseptic handwashing: Washing hands with antimicrobial soap and water before aseptic techniques.
  - 4.3.1.2.3 Antiseptic hand rubbing (or hand rubbing) with 60–80 % alcohol: Applying an antiseptic hand rub to reduce or inhibit the growth of microorganisms
- 4.3.1.3 ICU staff should strictly adhere to the five moments of Hand Hygiene.
- 4.3.1.4 Perform hand hygiene before wearing gloves and after removing gloves.
- 4.3.1.5 Perform hand hygiene when moving from a contaminated body site to a clean body site during patient care.
- 4.3.1.6 Perform hand washing when the hands are visibly soiled.
- 4.3.1.7 Perform hand washing before and after examining any patient.
- 4.3.1.8 Perform hand washing after caring for patients with an organism resistant to alcoholbased antiseptics such as Clostridium Diffcile, Norovirus, & Anthrax etc.
- 4.3.1.9 Wearing gloves is not a substitute for proper hand hygiene.
- 4.3.1.10 Nails should be short and clean. Artificial fingernails are not allowed and Jewelry should not be worn on hand or wrists by ICU staff

4.3.2 Cough Etiquette / Respiratory Hygiene:

- 4.3.2.1 All ICU staff must practice cough etiquette when coughing or sneezing.
- 4.3.2.2 Cover nose and mouth with a tissue when coughing or sneezing
- 4.3.2.3 Dispose of tissue after use in the waste receptacle and perform hand hygiene.

4.3.3 Personal Protective Equipment (PPE):

- 4.3.3.1 PPE must be available all times in the Intensive care unit in adequate amounts and proper qualities
- 4.3.3.2 PPE must be available in all sizes to be suitable for all health practitioners in intensive care
- 4.3.3.3 The Sequence of PPE Donning : - Gown – Mask - Goggles or Face Shield - Gloves
- 4.3.3.4 The Sequence of PPE Doffing: - Gloves – Goggle – Gown - Mask
- 4.3.3.5 Gloves:
  - 4.3.3.5.1 The type of gloves used depends on the procedure performed
  - 4.3.3.5.2 Should be used for all patients under contact precautions
  - 4.3.3.5.3 Should be used in contact with blood, other body substances or contaminated surfaces or items
  - 4.3.3.5.4 Should be changed between procedures on the same patient.
  - 4.3.3.5.5 Should be removed promptly after use and before contact with other patients
  - 4.3.3.5.6 Use the gloves as needed
- 4.3.3.6 Gown:
  - 4.3.3.6.1 The type of gown to be used depends on the procedure performed

- 4.3.3.6.2 It should be used for all patients under contact precautions.
- 4.3.3.6.3 It should be used for all patients when anticipating splashes of blood and body fluids.
- 4.3.3.6.4 Change the gown between patients and procedures.
- 4.3.3.6.5 Use the gown as needed
- 4.3.3.6.6 Disposable gowns should be discarded after use
- 4.3.3.7 Surgical mask:
  - 4.3.3.7.1 Should be used for all patients under droplet precautions
  - 4.3.3.7.2 Use the surgical mask if you expect blood or body fluids splashing
  - 4.3.3.7.3 Change mask between patients
  - 4.3.3.7.4 Change mask if became solid or moist or torn
  - 4.3.3.7.5 Should be used as a part of universal masking during the COVID-19 pandemic.
- 4.3.3.8 High-efficacy respirator (N95):
  - 4.3.3.8.1 A high-efficacy respirator should be used with the patient under airborne isolation.
  - 4.3.3.8.2 A high-efficacy respirator should be used with critical MERS COV, COVID-19 cases.
  - 4.3.3.8.3 A high-efficacy respirator should be used during aerosol-generating procedures (AGPs) for MERS COV, COVID-19 cases and all airborne diseases regardless of the patient's condition, whether it is stable or critical.
- 4.3.3.9 Face Shield/Eye Protection:
  - 4.3.3.9.1 Face shield or goggle should be used if anticipating blood and body fluids to HCW mucous membrane of their eyes.
- 4.3.4 Safe Injection Practices:
  - 4.3.4.1 Use aseptic technique when preparing and administering injectable medications
  - 4.3.4.2 use a sterile single-use disposable syringe and needle for each injection given
  - 4.3.4.3 All injection equipment and medication vials should be free of contamination, turbidity, or discoloration
  - 4.3.4.4 The sterile package should only be opened immediately before use on the patient and not before that.
  - 4.3.4.5. Disinfect the self-sealed rubber cap of a medication vial or an IV solution bottle with approved antiseptic wipes (e.g., alcohol wipes) before access
  - 4.3.4.6 Don't administer medications from the same syringe to multiple patients, even if the needle is changed.
  - 4.3.4.7 Don't reuse a syringe to enter a medication vial or solution.
  - 4.3.4.8 Use a fluid infusion or administration set (i.e., intravenous tubing) for one patient only
  - 4.3.4.9 Used needles should never be recapped, bend, or broken.
  - 4.3.4.10 All used sharps should be placed immediately in a puncture-resistant container that is designated for sharp disposal.
- 4.3.5 Environmental Cleaning:
  - 4.3.5.1 Environmental cleaning is under housekeeping responsibilities
  - 4.3.5.2 In the cleaning procedure, dust should not be dispersed into the air (wet mopping is the only allowed method).
  - 4.3.5.3 Scrubbing with a mop and an approved MOH disinfectant/detergent solution should be performed
  - 4.3.5.4 Cabinet counters, work surfaces, and similar horizontal areas should be cleaned once a day with an approved MOH intermediate-level disinfectant/detergent

- 4.3.5.5 Walls, windows, storage shelves, and similar non-critical surfaces should be scrubbed periodically with MOH approved low-level disinfectant/detergent solution as part of the general housekeeping program.
- 4.3.5.6 Friction cleaning is important to ensure the physical removal of dirt and contaminating microorganisms.
- 4.3.5.7 Patient room and bathroom should be cleaned daily and after patient discharge.
- 4.3.5.8 Clean or change the curtains for patients not on isolation precaution in a routine schedule and when visibly soiled
- 4.3.5.9 Change the curtain for a patient on isolation precaution after the patient is discharged, transferred, or taken out of isolation
- 4.3.5.10 In case of outbreaks, infection control practitioners should supervise all environmental cleaning and disinfection procedures.
- 4.3.5.11 Environmental cleaning should be done according to the approved cleaning schedule and with a cleaning checklist to ensure the quality of the process
- 4.3.5.12 Environmental terminal cleaning equipment (H2O2 and ultraviolet) are preferred to be used in terminal cleaning.
- 4.3.6 Transmission-Based Precautions:
  - 4.3.6.1 Isolation precautions contain two tiers: Standard Precautions and Transmission-based Precautions
  - 4.3.6.2 Transmission-based precaution 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.
  - 4.3.6.3 Types of transmission-based Precautions: All health care workers in the ICU must follow the correct sequences of donning and define for PPE.
    - 4.3.6.3.1 Contact Isolation Precautions: must be used together with Standard Precautions. All health care workers in the ICU must wear the appropriate PPE (Gown-Gloves) and other PPE as needed when anticipating contact with the patient or the patient's environment
    - 4.3.6.3.2 Droplet Isolation Precautions must be used together with Standard Precautions. All health care workers in the ICU must wear the appropriate PPE (Surgical Mask) and other PPE as needed. A surgical mask is required within three (3) feet of the patient.
    - 4.3.6.3.3 Airborne Isolation Precautions must be used together with Standard Precautions. A fit-tested respirator particulate mask (N95 or Higher) is required for all HCWs who will potentially care for patients in respiratory isolation
- 4.3.7 Aseptic technique: Components of Aseptic Technique:
  - 4.3.7.1 Appropriate Attire:
    - 4.3.7.1.1 Appropriate attire is based on the risk of the procedure and the area of the hospital where the procedure is performed
    - 4.3.7.1.2 Scrubs are not considered personal protective equipment (PPE).
    - 4.3.7.1.3 HCW performing procedures resulting in splashed or potential exposure to body fluids should wear impervious or fluid-resistant barriers as well as face and eye protection.
    - 4.3.7.1.4 Depending on the aseptic procedure being performed, barriers may include gloves, gown, and hair covering or as per hospital policy on PPE

4.3.7.2 Hand Hygiene: Hand decontamination prior to any procedure is an integral step of the process that should be done by the team working in direct contact with the patient, equipment, instruments, and/or sterile field.

4.3.7.3 Skin Antisepsis: Use the appropriate recommended antiseptic for each procedure type as well as screening for contraindications such as allergies.

4.3.7.4 Single-use devices, Equipment, and Supplies:

- 4.3.7.4.1 HCW should maintain the sterile packaging and/or container integrity to ensure an intact seal and confirm that sterilization indicators with an expiration date are verified
- 4.3.7.4.2 Before use, sterile packages should always be inspected for signs of contamination such as moisture, tears, discoloration, and expiration.
- 4.3.7.4.3 DO NOT reuse single-use items.

4.3.7.5 Environmental Cleaning:

- 4.3.7.5.1 Clean and disinfect the environmental surfaces using MOH-approved disinfectants and the use of an efficacious germicidal agent for clean-up of blood or body fluid spills are recommended for controlling the environment to reduce the risk of contamination and microbial transmission in all patient care settings.
- 4.3.7.5.2 Use clean equipment and supplies (i.e., mops, water, cleaning cloths) for environmental hygiene.
- 4.3.7.5.3 Use a checklist for training and quality monitoring of operating room cleaning procedures.

4.3.8 Clean Technique:

- 4.3.8.1 Wear clean gloves instead of sterile gloves after hand antisepsis where clean technique is indicated
- 4.3.8.2 Use the “no-touch” dressing technique to prevent contamination of sterile dressings, depending on the type and extent of the procedure.
- 4.3.8.3 Use clean gloves for routine changing of surgical site dressings, tracheostomy care, and maintenance of intravascular lines, as long as you use techniques that prevent the transfer of new organisms or movement from one site to another patient.
- 4.3.8.4 Wear a clean gown to minimize contamination of clothing, following standard precaution guidelines

4.3.9 Surgical Aseptic Technique Outside the Operating Room (OR):

- 4.3.9.1 Settings outside the OR may not have the capacity to follow the same strict level of surgical asepsis applied in the OR. However, the goal to avoid infections remains in all clinical settings.
- 4.3.9.2 Using environmental controls to maximize the reduction of microorganisms during surgical procedures is essential.

4.3.10 Medication preparation:

- 4.3.10.1 A separate clean area is available for the preparation of medications and away from patients' treatment areas.
- 4.3.10.2 Use only ready-made single-dose sterile solutions for preparation & dilution of Medications.
- 4.3.10.3 Single-dose or single-use vial is used for a single procedure/injection in a single patient
- 4.3.10.4 Single- dose or single-use vial is not stored for future use even on the same patient.
- 4.3.10.5 Whenever possible, a multi-dose vial is used for a single patient, with recorded patient's name and date of the first use (when it has been accessed

for the first time), and discarded after 28 days unless the manufacturer specifies a different shorter or a longer date (i.e., reuse life).

4.3.10.6 If a multi-dose vial is used for more than one patient, it is exclusively kept and accessed in the area specified for the preparation of medications

4.3.10.7 Cartridge devices such as insulin pens are used for only one patient.

4.3.10.8 The self-sealed rubber cap of a medication vial or an IV solution bottle is disinfected with approved antiseptic wipes (e.g., alcohol wipes) prior to any access.

4.3.10.9 IV solution bottles are only accessed through the self-sealed rubber cap after being disinfected.

4.3.10.10 IV sets that are used to administer blood, blood products will be replaced every 4 hours

4.3.10.11 IV sets that are used to administer lipid emulsions, or dextrose/amino acid Total Parenteral Nutrition (TPN) solutions are replaced within 24 hours of initiating the infusion.

4.3.10.12 Sterile solutions are used in nebulizers, humidifiers, or any aerosol-generating system and changed between patients and every 24 hours for the same patient unless the manufacturer of ready-made sterile solutions specifies different dates.

4.3.10.13 A peripheral venous catheter must be properly fixed, with a clearly written date of insertion, and to reduce risk of infection and phlebitis, it is replaced - if still needed, but it is not replaced more frequently than every 72 to 96 hours.

4.4 Active Screening in the MICU

4.4.1 Multi Drug-Resistant Organisms are microorganisms that are resistant to one or more classes of antimicrobial agents.

4.4.1.1 Management of MDRO-Positive Patients:

4.4.1.1.1 Use contact precautions in addition to standard precautions

4.4.1.1.2 A patient must be in a single room or can be cohorted with another patient with the same organism.

4.4.1.1.3 Place contact isolation sign on the cubicle or curtain of the patient's bed

4.4.1.1.4 Use dedicated patient-care equipment

4.4.1.1.5 If common use of equipment for multiple patients is unavoidable, clean and disinfect such equipment before use on another patient

4.4.1.1.6 Ensure easy access to PPE and alcohol-based hand rub.

4.4.1.1.7 Notify receiving departments/wards (e.g., Radiology, Endoscopy, OR) of the patient's isolation status when the patient must be transported for treatment/tests, under Transporting Patients on Isolation Precautions

4.4.1.1.8 Ensure that all staff understand and comply with the isolation precautions and hand hygiene protocol

4.4.1.1.9 Ensure concurrent and terminal cleaning of the isolation room and equipment as per housekeeping procedure

4.4.1.1.10 Handle/discard contaminated items as per Standard Precautions.

4.4.1.1.11 If the patient is being transferred to another hospital or healthcare facility while still colonized or infected with an MDRO, the transferring hospital is obliged to inform the receiving hospital of the details of the MDRO in order to ensure proper isolation. EMS and other healthcare providers are involved in transferring.

4.4.1.1.12 Discontinue isolation of MDRO-positive patients after (three) consecutive negative cultures from all previously positive sites. If the first set of samples, which was taken 3 days off antibiotics, is negative, repeat cultures 48 hours later and consultation with the IPs.

4.4.2 MRSA Screening: Must be done for all patients admitted to ICU

4.4.2.1 Management of (MRSA) Positive Patients:

4.4.2.1.1 Microbiology Laboratory should inform ICU for any MRSA-positive patients.

4.4.2.1.2 Notified immediately the Infection Prevention and control department for any new positive MRSA cultures

4.4.2.1.3 Put the patient in a single room

4.4.2.1.4 Put a contact precautions sign on the outside of the room door

4.4.2.1.5 Apply standard precautions and contact precautions

4.4.2.1.6 Wear (a gown and gloves) when entering the patient's room

4.4.2.1.7 Specific HCW must be identified to provide the service to the patient

4.4.2.1.8 When transferring the patient to another department (e.g., Radiology, OR) notify receiving departments

4.4.2.1.9 Regular cleaning for the patient room. Terminal cleaning must be done after patient discharge

4.4.3 Discontinuation of Contact Isolation for (MRSA) Positive Patients:

4.4.3.1 Antibiotic therapy is completed at least three days prior to rescreening.

4.4.3.2 Vancomycin levels should be zero prior to rescreening.

4.4.3.3 Three consecutive negative cultures from all previously positive sites. If the first set of samples, which was taken 3 days off antibiotics is negative, repeat cultures 48 hours later.

4.4.3.4 The patient should not be receiving antibiotic therapy at any time during the screening process.

4.5 MRSA Decolonization Protocol:

4.5.1 Supplies:

4.5.1.1 Chlorhexidine Gluconate (CHG) 4%

4.5.1.2 Mupirocin / Bactroban (only if the organism is Mupirocin-sensitive) per MD orders

4.5.1.3 Clean linens for the bed and patient

4.5.1.4 Personal Protective Equipment (PPE).

4.5.2 Steps:

4.5.2.1 Apply Chlorhexidine gluconate 4% solution to the body of the patient (from neck to toes),

4.5.2.2 Ensuring coverage of underarms, groin, and between fingers and toes

4.5.2.3 Rinse the body of the patient (from neck to toes) with warm water and dry skin with a clean towel

4.5.2.4 Change the bed linens and the patient's clothing completely after each bath

4.5.2.5 Repeat this process twice a day

4.5.2.6 Shampoo hair with the Chlorhexidine solution for 3 days

4.5.2.7 Apply Mupirocin/Bactroban ointment to anterior nares (inside nose) after Chlorhexidine treatment, when the patient is dry as ordered by the physician.

4.5.2.8 Do not apply Mupirocin to open wounds

4.5.2.9 Continue These treatments 7 consecutive days

4.5.2.10 Take a complete set of cultures from nares and previously positive sites 72 hrs. after decolonization.

4.5.2.11 If the first set of samples is negative repeat cultures 48 hrs. later

4.5.2.12 Three negative cultures are required before the patient is cleared of MRSA and can be taken out of isolation.

4.5.2.13 These results will be assessed by the IP.

4.5.2.14 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

4.6 Management Vancomycin-Resistant Enterococci (VRE):

4.6.1 Screen all patients who are known to be previously VRE positive within the past 6 months or more.

4.6.2 Screen all patients who are Roommates to VRE-positive patients for more than 48 hours.

4.6.3 Put the suspected VRE patient in a single room

4.6.4 Apply standard precaution and contact precaution for suspected VRE patient.

4.6.5 Patients at risk of VRE:

4.6.5.1 Critically ill patients who have received lengthy courses of antibiotics.

4.6.5.2 Solid-organ or bone marrow transplant recipients.

4.6.5.3 Patients with hematologic malignancies.

4.6.5.4 Health care workers.

4.6.5.5 Intestinal colonization.

4.6.5.6 Prior long-term antibiotic use - Mucositis - Neutropenia - Indwelling urinary catheters - Corticosteroid treatment. - Chemotherapy - Parenteral nutrition.

4.6.6 Sites to be screened: - Peri-anal area. - Wounds and catheter exit sites

4.6.7 Management of Positive (VRE) Patients:

4.6.7.1 Microbiology Laboratory must be informing the ICU for any VRE-positive patients.

4.6.7.2 Inform immediately the Infection Prevention and control department for any new positive VRE cultures

4.6.7.3 Put the patient in a single room

4.6.7.4 Put a contact precautions sign on the outside of the room door

4.6.7.5 Apply standard precaution and contact precaution

4.6.7.6 Wear (a gown and gloves) when entering the patient's room

4.6.7.7 Staff that will provide care to the patient must be determined.

4.6.7.8 When transferring the patient to another department (e.g., Radiology, OR) notify receiving departments

4.6.7.9 Regular cleaning for the patient room

4.6.7.10 Terminal cleaning must be done after patient discharge

4.6.8 Discontinuation of Contact Isolation for (VRE) Positive Patients:

4.6.8.1 Discontinue the Contact Isolation for (VRE)Positive Patients by consultation with infection control and physician

4.6.8.2 There must be three consecutive negative cultures from all previously positive sites and stool/peri-rectal swabs. If the first set of sample which was taken 3 days off antibiotics is negative, repeat cultures 48 hours later

4.6.8.3 Patients should be off antibiotic therapy for a minimum of 72 hours before the screening.

4.7 Carbapenem-Resistant Enterobacteriaceae (CRE) Management:

4.7.1 (CRE) Screening must be done for all patients who are admitted to ICU Sites to screen:

4.7.1.1 Peri-anal swabs or rectal.

4.7.1.2 Skin sites, wounds or urine (if a urinary catheter is present).

4.7.1.3 Patient at risk of Carbapenem-Resistant:

4.7.1.3.1 Prolonged length of ICU stay

4.7.1.3.2 Previous use of aminoglycoside and carbapenems

4.7.1.3.3 Surgery

4.7.1.3.4 Dialysis during ICU stay

4.7.1.3.5 Mechanical ventilation

4.7.1.3.6 Malnourishment at ICU admission

4.7.2 Management of Positive (CRE) Patients:

- 4.7.2.1 Microbiology Laboratory must be informed the ICU for any CRE-positive patients.
- 4.7.2.2 Inform immediately the in Infection Preventions and control department for any new positive CRE cultures
- 4.7.2.3 Put the patient in a single room
- 4.7.2.4 Put a contact precautions sign on the outside of the room door
- 4.7.2.5 Apply standard precaution and contact precaution
- 4.7.2.6 Wear (a gown and gloves) when entering the patient's room
- 4.7.2.7 Staff that will provide care to the patient must be determined.
- 4.7.2.8 When transfer the patient to another department (e.g., Radiology, OR) notify receiving departments
- 4.7.2.9 Regular cleaning for the patient room.
- 4.7.2.10 Terminal cleaning must be done after patient discharge

4.8 Clostridium Difficile Infection (CDI) Management:

- 4.8.1 Clostridium difficile infection (CDI) is caused by an anaerobic spore-forming gram positive bacillus
- 4.8.2 Microbiology Laboratory must inform ICU staff for any VRE-positive patients.
- 4.8.3 Inform immediately Infection Preventions and control department for any new positive VRE cultures
- 4.8.4 Put the patient in a single room
- 4.8.5 Hand hygiene should be performed using soap and water at the point of care
- 4.8.6 Put a contact precautions sign on the outside of the room door
- 4.8.7 Apply standard precaution and contact precaution
- 4.8.8 Wear (gown and gloves) when entering the patient's room
- 4.8.9 Staff that will provide care to the patient must be determined.
- 4.8.10 When transfer the patient to another department (e.g., Radiology, OR) notify receiving departments
- 4.8.11 Regular cleaning for the patient room at least twice daily.
- 4.8.12 Room and bed spaces should be cleaned and decontaminated by using a 1:10 hypochlorite solution agent or other sporicidal hospital approved disinfectant
- 4.8.13 Terminal cleaning must be done after patient discharge

4.9 Risk of Clostridium Difficile Infection:

- 4.9.1 Advanced age (>60 y)
- 4.9.2 Hospitalization (intensive care unit stays, and prolonged hospital stays)
- 4.9.3 Immune suppression
- 4.9.4 Gastric acid suppression.
- 4.9.5 Inflammatory Bowel Disease (IBD)

4.10 Care Bundles for Prevention of Device Associated Infections in ICUs: A bundle is a structured way of improving the processes of care and patient outcomes. It is a small, straightforward set of evidence-based practices, generally, three to five — that, when performed collectively and reliably, have been proven to improve patient outcomes.

4.11 Type of Prevention Care Bundles:

- 4.11.1 Central line Insertion bundle • Central line maintenance bundle • Ventilator bundle • Urinary catheter bundle
- 4.11.2 **Components of Central Line (Insertion) Bundle:** It is a group of evidence-based interventions for patients with intravascular central catheters that, when implemented together, result in better outcomes (reduce BSI) than when implemented individually.
  - 4.11.2.1 Hand hygiene: Washing hands or using an alcohol-based waterless hand antiseptic helps to prevent contamination of central line sites and resultant bloodstream infections.
  - 4.11.2.2 Maximal barrier precautions
    - 4.11.2.2.1 For the operator placing the central line and for those assisting in the procedure.

- 4.11.2.2.2 Maximal barrier precautions mean strict compliance with hand hygiene and wearing a cap, mask, sterile gown, and sterile gloves.
- 4.11.2.2.3 The cap should cover all hair and the mask should cover the nose and mouth tightly.
- 4.11.2.2.4 These precautions are the same as for any other surgical procedure that carries a risk of infection.
- 4.11.2.2.5 For the patient, applying maximal barrier precautions means covering the patient from head to toe with a sterile drape, with a small opening for the site of insertion.
- 4.11.2.3 Chlorhexidine skin antisepsis
- 4.11.2.3.1 Prepare skin with antiseptic/detergent chlorhexidine 2% in 70% isopropyl alcohol.
- 4.11.2.3.2 Pinch wings on the chlorhexidine applicator to break open the ampule.
- 4.11.2.3.3 Hold the applicator down to allow the solution to saturate the pad (sometimes there is no applicator only a swab stick impregnated with the antiseptics).
- 4.11.2.3.4 Press sponge against the skin, and apply chlorhexidine solution using a back-and-forth friction scrub for at least 30 seconds, do not wipe or blot.
- 4.11.2.3.5 Allow antiseptic solution time to dry completely before puncturing the site (2 minutes)
- 4.11.2.4 Optimal catheter site selection, with subclavian vein as the preferred site for nontunneled catheters.
  - 4.11.2.4.1 Several non-randomized studies show that the subclavian vein site is associated with a lower risk of CLABSI than the internal jugular vein.
  - 4.11.2.4.2 The bundle requirement for optimal site selection suggests that other factors (e.g., the potential for mechanical complications, the risk of subclavian vein stenosis, and catheter-operator skill) should be considered when deciding where to place the catheter.
  - 4.11.2.4.3 In these instances, teams are considered compliant with the bundle element as long as they use a rationale construct to choose the site.
  - 4.11.2.4.4 The physician must determine the risks and benefits of using any vein.
- 4.11.2.5 Appropriate draping.
- 4.11.2.6 Avoid femoral vein catheterization
- 4.11.2.7 Use ultrasound guidance central vein catheterization technique.
- 4.11.2.8 Daily review of line necessity, with prompt removal of unnecessary lines. Daily review of central line necessity will prevent unnecessary delays in removing lines that are no longer needed for the care of the patient. However, it is clear that the risk of infection increases over time as the line remains in place and that the risk of infection decreases if the line is removed when it is not required anymore.
- 4.11.2.9 Remove central line if line sepsis is suspected.
- 4.11.3 Components of Central Line Maintenance Bundle:
  - 4.11.3.1 It is a group of evidence-based interventions for patients with intravascular central catheters that, when implemented together, result in better outcomes (reduce CLABSI) than when implemented individually.
    - 4.11.3.1.1 Hand hygiene before catheter access/manipulation

- 4.11.3.1.2 Daily review of catheter necessity with prompt removal of unnecessary lines.
- 4.11.3.2 Proper Dressing Choice:
  - 4.11.3.2.1 Use transparent semipermeable dressing
  - 4.11.3.2.1 Use gauze only if the site is bleeding or oozing
- 4.11.3.3 Proper frequency of dressing change:
  - 4.11.3.3.1 Replace transparent dressing every 7 days
  - 4.11.3.3.2 Replace gauze dressing every 48 hours
  - 4.11.3.3.3 Replace immediately any dressing that is soiled, dampened, or loosened.
- 4.11.3.4 Proper Replacement of Administrative Sets:
  - 4.11.3.4.1 Unless used for blood, blood products or fat emulsions, replace administration sets no more frequently than at 72-hour intervals, but at least every 7 days.
  - 4.11.3.4.2 If used for blood/blood products, replace administration sets every 4 hours.
  - 4.11.3.4.3 If used for TPN/ intralipids, replace administration sets every 24 hours.
  - 4.11.3.4.4 If used for chemotherapy, replace administration sets after each use.
  - 4.11.3.4.5 Caps are changed no more often than 72 hours or whenever the administration set is changed.
- 4.11.3.5 Aseptic technique: It is for accessing and changing the needleless connector, catheter hubs and injection ports using chlorhexidine 2% (30-second scrub and 30-second airdry).
- 4.11.3.6 Use a prepackaged dressing-change kit
- 4.11.3.7 Replacement of Central Venous Catheters (CVCs), Including PICCs and Hemodialysis Catheters:
  - 4.11.3.7.1 Do not routinely replace CVCs, PICCs, hemodialysis catheters, to prevent catheter-related infections.
  - 4.11.3.7.2 Use clinical judgment regarding the appropriateness of removing the catheter if the infection is evidenced.
  - 4.11.3.7.3 Do not use guidewire exchanges routinely for non-tunneled catheters to prevent infection.
  - 4.11.3.7.4 Do not use guidewire exchanges to replace a non-tunneled catheter suspected of infection.
  - 4.11.3.7.5 Use a guidewire exchange to replace a malfunctioning non-tunneled catheter if no evidence of infection is present.
  - 4.11.3.7.6 Use new sterile gloves before handling the new catheter when guidewire exchanges are performed.
- 4.11.4 Ventilator Bundle: A ventilator bundle is a group of evidence-based interventions for patients with a ventilator that, when implemented together, result in better outcomes (reduce VAE including VAP) than when implemented individually.
  - 4.11.4.1 Elevation of the head of the bed to 30-45 degrees if not contraindicated.
  - 4.11.4.2 Daily spontaneous awakening trials and spontaneous breathing trials
  - 4.11.4.3 Early mobility, and physiotherapy
  - 4.11.4.4 Minimization of sedation and avoidance of neuromuscular blockers unless there is a clear indication
  - 4.11.4.5 Daily assessment of readiness to extubate
  - 4.11.4.6 Daily oral care with chlorhexidine.
  - 4.11.4.7 Deep venous thrombosis (DVT) prophylaxis (unless contraindicated)

4.11.5 Components of Urinary Catheter Bundle: A urinary catheter bundle is a group of evidence-based interventions for patients with a urinary catheter that, when implemented together, result in better outcomes (reduce CAUTI) than when implemented individually.

4.11.5.1 Avoid unnecessary urinary catheters, not all critically ill, immobile patients need Foley catheters.

4.11.5.2 Insert using the aseptic technique.

4.11.5.3 Maintain catheters based on recommended guidelines (daily care).

4.11.5.4 Review catheter necessity daily and remove promptly.

4.11.5.5 Indications for Placement of Urinary Catheters:

4.11.5.5.1 Perioperative use for selected surgical procedures

4.11.5.5.2 Urine output monitoring in critically ill patients

4.11.5.5.3 Management of acute urinary retention and urinary obstruction

4.11.5.5.4 Assistance in pressure ulcer healing for incontinent patients

4.11.5.5.5 As an exception, at patient request to improve comfort (SHEA-IDSA) or for comfort during end of life care (CDC).

4.11.5.6 Proper Placement of Urinary Catheters:

4.11.5.6.1 A urinary catheter is inserted only by trained personnel following aseptic technique:

4.11.5.6.2 Perform appropriate hand hygiene practice, immediately before insertion of the catheter.

4.11.5.6.3 Insert catheters using aseptic technique and sterile equipment, by using:

4.11.5.6.3.1 Gloves, a drape, and sponges;

4.11.5.6.3.2 Sterile or antiseptic solution for cleaning the urethral meatus; and

4.11.5.6.3.3 A single-use packet of sterile lubricant for insertion.

4.11.5.6.4 Use as small a catheter as possible that is consistent with proper drainage, to minimize urethral trauma.

4.11.5.7 Routine Maintenance of Urinary Catheter:

4.11.5.7.1 Maintain a sterile, continuously closed drainage system.

4.11.5.7.2 Keep catheter properly secured to prevent movement and urethral traction.

4.11.5.7.3 Keep the collection bag below the level of the bladder at all times.

4.11.5.7.4 Maintain unobstructed urine flow.

4.11.5.7.5 Empty collection bag regularly, using a separate collecting container for each patient, and avoid allowing the draining spigot to touch the collecting container.

4.11.5.7.6 Routine hygiene (e.g., cleansing of the meatal surface during daily bathing) is appropriate. Do not clean the per urethral area with antiseptics to prevent CAUTI while the catheter is in place.

4.11.5.7.7 The collection of urine samples should follow the aseptic technique.

4.12 Surveillance:

4.12.1 Surveillance is a systematic method of ongoing collection, consolidation, and data analysis concerning the distribution and determinants of a given disease or event, followed by the dissemination of that information to those who can improve the outcome.

4.12.2 Surveillance of Healthcare-Associated Infections & MDROs must be conducted in the ICUs for prevention of device associated HAIs (CAUTI, CLABSI, VAEs) & Non-device associated HAIs such as BSI, Pneumonia and UTIs.

4.12.3 ICU staff must ensure strict implementation of all elements of care bundles as part of

process surveillance.

4.13 Outbreak Management. See Policy 121 Outbreak Management

- 4.13.1 Outbreak management should be undertaken when there is a significant increase in the rate of infection at a certain body site or with a particular microbe, this involves the identification of common risk factors for transmission or acquisition of infection.
- 4.13.2 A review of infection prevention procedures, including compliance with hand hygiene, aseptic techniques, and practices for sterilization and disinfection, should be performed.
- 4.13.3 Infected or colonized patients should be rapidly identified and either isolated or cohorted.
- 4.13.4 Cohorts should be maintained until all infected and exposed patients are discharged.

4.14 Prevention of Transmission to /and from Health Care Workers:

- 4.14.1 Standard Precautions should be applied to minimize the risk of potential infection with blood-borne viruses.
- 4.14.2 HCWs should report acute infections; Consultation with staff health clinic should be done to assess the need for sick leave and contact screening and post-exposure management.
- 4.14.3 HCWs with exudative or herpetic hand lesions should not have direct patient contact or handle patient care equipment.
- 4.14.4 Wearing a mask can prevent the touching of oral lesions.
- 4.14.5 HCWs with airborne infections should not work.
- 4.14.6 Non-immune HCW with significant exposure to varicella, measles, rubella, or mumps should not work during the latter part of the incubation period because these infections can be transmitted before the onset of symptoms.

4.15 Dead Body Management

- 4.15.1 All dead bodies must be handled using standard precautions
- 4.15.2 Appropriate personal protective equipment should be worn when handling the bodies of the deceased (if exposed to body fluids).
- 4.15.3 If the deceased patient was under transmission passed precautions, they should be continued after death.
- 4.15.4 In the case of death from highly contagious infectious diseases, relatives should be prevented from direct contact with the dead body.

4.16 Sample Collection

- 4.16.1 For a stable non-ventilated case, respiratory sampling (NP swab) can be safely performed in a well-ventilated single room equipped if available, with a portable certified HEPA filter
- 4.16.2 For severe cases, respiratory sampling (lower respiratory or NP) must be performed in a negative pressure room OR a well-ventilated single room with Portable certified HEPA filter
- 4.16.3 Health care worker must wear recommended PPEs (eye protection, isolation gown, clean gloves, N95 mask or PAPR ((If N95 or PAPR are not available use surgical mask with face Shield))

## 5. MATERIALS AND EQUIPMENT:

5.1 **Forms and Records:**

- 5.1.1 N/A

5.2 **Materials and Equipment**

- 5.2.1 N/A

## 6. RESPONSIBILITIES:

- 6.1 Healthcare epidemiologists, healthcare administrators, nurses & healthcare providers working in Maternal ICUs.
- 6.2 Infection Control Team:
  - 6.2.1 Conduct surveillance of healthcare-associated and device-related infections
  - 6.2.2 Monitor and supervise the implementation of Infection Control practices in the Intensive Care Unit.

6.2.3 Provide ongoing education and training to HCWs.

6.2.4 Conduct competencies annually as per protocol

6.2.5 Improve awareness and work practices.

6.3 ICU staff:

6.3.1 Strict adherence to Infection Control practices & care bundles implementation for best patient's outcomes.

6.3.2 ICU staff must be well trained and competent enough to implement IC measures to ensure the prevention of cross-infection transmission & HAI outbreaks in the ICU setting.

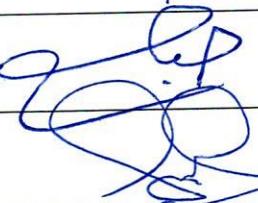
## 7. APPENDICES:

7.1 N/A

## 8. REFERENCES:

8.1 General Directorate of Infection Prevention and Control in Healthcare Facilities (GDIPC). Infection Prevention & Control Guidelines for Adult Intensive Care Units (ICUs) 1st Edition 1443 – 2021

## 9. APPROVALS:

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