HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

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1. PURPOSE:

1.1 To provide recommended infection control guidance to safe neonates & HCWs in the neonatal intensive care unit (NICU).

2. DEFINITONS:

2.1 Neonate:
- 2.1.1 There are six definitions for the neonate depending on:
  - 2.1.1.1 Extremely low birth weight =Any neonate weighing less than 1000 grams at birth.
  - 2.1.1.2 Very low birth weight -Any neonate weighing less than 1,500 grams at birth.
  - 2.1.1.3 Low birth weight -Any neonate weighing less than 2,500 grams at birth, regardless of gestational age.
  - 2.1.1.4 Preterm =Any neonate born before and through the end of the last day of the 37th week (259th day).
  - 2.1.1.5 Term: Any neonate born from the beginning of the first day (260th day) of the 38th week through the end of the last day of the 42nd week (294th day).
  - 2.1.1.6 Post-term Any neonate born from the beginning of the first day (295th day) of the 43rd week and later.

2.2 Newborn nursery
- 2.2.1 A nursery providing routine care and observation of healthy term infants and for late preterm infants born at 35 to 37 weeks who are physiologically stable.

2.3 Special care nursery (SCN)
- 2.3.1 A nursery providing care to ill neonates requiring 6 to 12 hours per day of nursing care but do not need intensive care.

2.4 Neonatal intensive care unit (NICU)
- 2.4.1 Areas providing intensive care for severely ill newborns reflecting continuous nursing, cardiopulmonary care, and other supportive services.

2.5 Classification of Levels of Neonatal Care.
- 2.5.1 These categories include: Level I
  - 2.5.1.1 Newborn nursery; 1 Well newborn nursery (stabilize ill newborn infants and those born before 35 weeks until transfer to a higher level of care and provide postnatal care to stable term and stable infants born at 35 to 37 weeks).
- 2.5.2 Level II: Special care nursery
  - 2.5.2.1 Special care nursery (level I capabilities plus care for infants born at 32 weeks of gestation or later and weigh 1 ,500 grams or more who are moderately ill with problems expected to resolve rapidly).
- 2.5.3 Level III: NICU
  - 2.5.3.1 NICU (level II capabilities plus provide sustained life support, comprehensive care for infants born before 32 weeks and weighing less than 1 ,500 grams, full range of pediatric subspecialists, full range of respiratory support, and advanced imaging with urgent interpretation).

3. POLICY:

3.1 Standard precaution must be applied in NICU department.

3.2 Staff must clean their hands, wear disposable gown and clean gloves in case direct contact or providing care to new-borns outside their incubator.

3.3 Routine screening for all NICU 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:

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

4. PROCEDURE:

4.1 Infection Control Requirements Regarding the Design and Finishing of NICU:

4.1.1 Space Requirements:

- 4.1.1.1 The design should provide adequate space for appropriate care of infants and the necessary patient care equipment.
- 4.1.1.2 In multiple infant rooms, including ones with bays, cubicles, or movable cubicle partitions, each infant care station should contain a minimum clear floor area of 1 1.15 square meters per infant care bed.
- 4.1.1.3 At least 2.4m between incubators.
- 4.1.1.4 In multiple infant rooms, there should be an aisle adjacent to each infant care station with a minimum width of 1.22 meters.
- 4.1.1.5 Rooms intended for the use of a single infant should contain a minimum clear floor area of 15.3 square meters.

4.1.2 Hand-Washing Stations:

- 4.1.2.1 In multiple infant rooms, there should be an aisle adjacent to each infant care station with a minimum width of 1.22 meters.
- 4.1.2.2 In a multiple-infant room, every bed position shall be within 6.10 meters of a hand washing station.
- 4.1.2.3 There should be at least 1 hands-free handwashing sink for every 4 beds.
- 4.1.2.4 Where infant care stations are single-infant rooms, a hand-washing station should be provided in each room.
- 4.1.2.5 The handwashing sink should be large and deep enough to prevent splashes; non-absorbent wall material should be used around the sink to prevent the growth of mold and cellulose.

4.1.3 Airborne Infection Isolation Room (AIR):

- 4.1.3.1 NICU should have at least one airborne infection isolation room or more based on risk assessment.
- 4.1.3.2 NICU AIR 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 Finishing:

- 4.1.4.1 Wall, Floors, and ceiling surfaces should be easily cleanable and highly durable to withstand frequent cleaning and disinfection with an approved disinfectant.

4.2 Sources of Infection in NICU:

4.2.1 Colonized infants are the major source of infection.
4.2.2 Contaminated hands of HCWs
4.2.3 Patient care equipment that is not properly disinfected (suction devices, ventilator circuits, rectal thermometers, feeding bottles).
4.2.4 Contaminated supplies such as topical preparations used for skin or cord.
4.2.5 Contaminated intravenous medications and fluids prepared in hospital pharmacy.
4.2.6 Water reservoirs are potential sources of microorganisms such as Pseudomonas, Stenotrophomonas, Serratia, and Flavobacterium.
4.2.7 Infant nutrition is another potential source of infection.
4.2.8 Personnel or visitors with acute infections can infect infants.

4.3 Risk Factors for Neonatal Infections:

4.3.1 New-Born Risk Factors That Increase the Risk of Infection:

4.3.1.1 Lower birth weight (ELBW>VLBW).
4.3.1.2 Younger gestational age.
4.3.1.3 Immunology of the neonate, Immunocompromised, immature, ineffective, and inadequate levels of antibodies.
4.3.1.4 Co-morbidities (e.g.: congenital conditions).

4.3.2 Care-Related Risk Factors That Increase the Risk of Infection:

4.3.2.1 Intensive care stay.
4.3.2.2 Presence of invasive medical devices.
4.3.2.3 Parenteral nutrition.
4.3.2.4 Antimicrobial therapy may lead to multiple drug resistance organism (MDRO) infections.
4.3.2.5 Overcrowding and Understaffing.
4.3.2.6 Ward layout (sinks, bed spacing).
4.3.2.7 Use of foetal scalp electrodes/ probes and cannula.
4.3.2.8 Contact with colonized/ infected family, visitors, or healthcare workers.
4.3.2.9 The proximity of colonized neonates.
4.3.2.10 Increased length of stay.

4.4 Common Types of Hospital Infections in the NICU:

4.4.1 Bloodstream infections (BSI):

4.4.1.1 Central Venous Catheter (CVC)/ PICC.
4.4.1.2 Umbilical catheter-associated bloodstream infections Prevalence.
4.4.1.3 Ventilator-associated event

4.5 General Infection Control Considerations in NICU:

4.5.1 Hand hygiene practices must be strictly applied and monitored.
4.5.2 NICU staff should strictly follow hand hygiene practice, wear disposable gown and clean gloves in case of direct contact or providing care to newborns outside their incubator.
4.5.3 Standard precautions must be applied to all neonatal intensive care patients.
4.5.4 Aseptic technique must be followed when wound dressing and catheterization.
4.5.5 No food or drinks are allowed in patient care areas.
4.5.6 Transport neonates with an infectious disease should be kept under isolation precautions.
4.5.7 Neonates with MRSA disease should be kept under contact isolation precautions.
4.5.8 Neonates with invasive devices should be monitored & included in the infection prevention and control surveillance program.
4.5.9 Perform device surveillance bundles for patients with central line and catheter daily.
4.5.10 Report all communicable diseases immediately to the infection control department
4.5.11 Antimicrobial stewardship program should be implemented & monitored.
4.5.12 Early discharge neonates from the hospital are recommended to reduce the risk of exposure to other infant's flora and contact with HCWs.

4.6 Routine Infection Prevention Measures in NICU:

4.6.1 Standard precautions:

4.6.1.1 Hand Hygiene:
4.6.1.2 Types of Hand Hygiene:

4.6.1.2.1 Simple hand washing: Washing hands with soap and water.

4.6.1.2.2 Antiseptic hand washing: Washing hands with antimicrobial soap and water before aseptic techniques.

4.6.1.2.3 Antiseptic hand rubbing (or hand rubbing) with 60-80 % alcohol:

4.6.1.2.3.1 Applying an antiseptic hand rub to reduce or inhibit the growth of microorganisms without the need for an exogenous source of water and requiring no rinsing or drying with towels or other devices.

4.6.1.2.3.2 NICU staff Should Strictly Adhere to the 5 Moments of Hand hygiene.

4.6.1.2.3.3 Use hand washing when the hand visibly solid or when after caring for patients with an organism resistant to alcohol-based antiseptics such as C. DIFFICILE, NOROVIRUS, OR ANTHRAX .

4.6.1.2.3.4 The hand should be washed when gloves are removed and before wearing gloves.

4.6.1.2.3.5 Wearing gloves is not a substitute for proper hand hygiene.

4.6.1.2.3.6 Nails should be short and clean. Artificial fingernails are not allowed. Jewelry should not be worn on hand or wrists by NICU staff.

4.6.1.3 Personal Protective Equipment (PPE):

4.6.1.3.1 Gloves:

4.6.1.3.1.1 Should be used for all patients under contact precautions.

4.6.1.3.1.2 Should be removed promptly after use and before contact with other patients

4.6.1.3.1.3 Should be used when HCW in contact with blood and body fluid secretion, and items contaminated with these substances.

4.6.1.3.1.4 Do not touch face or adjust PPE after wearing gloves.

4.6.1.3.1.5 Remove gloves if torn and wash hands before wearing new gloves.

4.6.1.3.2 Gown:

4.6.1.3.2.1 When a neonate is held outside the bassinet by nursing or other. neonatal intensive care unit personnel, a clean gown should be worn over the clothing and discarded after use.

4.6.1.3.2.2 Should be used for all patients under contact precautions.

4.6.1.3.2.3 Should be used to all patients when anticipating splashes of blood and body fluids.

4.6.1.3.2.4 Should be used when parents come in contact with their babies.

4.6.1.3.2.5 A separate gown should be used for each infant and discarded after use.

4.6.1.3.3 Surgical mask:

4.6.1.3.3.1 Should be used for staff caring of patients under droplet precautions. Should be used for parents who are coming in contact with their babies with respiratory symptoms.

4.6.1.3.3.2 Should be used during procedures that may generate splashes or Spray with blood and body fluid, secretion.

4.6.1.3.3.3 Should be used as a part of universal masking during the COVID-19 pandemic.

4.6.1.3.4 Face shields\ Goggles:Face shield or goggle should be used if anticipating blood and body fluids to HCW mucous membrane of their eyes.

Note: Personal glasses are not considered as a substitute for eye protection equipment.

4.6.1.4 The Sequence of PPE Donning: Gown • Mask • Goggles or Face Shield • Gloves

4.6.1.5 The Sequence of PPE Doffing:• Gloves • Goggle • Gown • Mask

Note: Hand hygiene is very important practice before donning and doffing of PPE.

4.6.1.6 Environmental Cleaning & Housekeeping:

4.6.1.6.1 In the cleaning procedure, dust should not be dispersed into the air (wet mobbing is the only allowed method).

4.6.1.6.2 Scrubbing with a mop and a disinfectant/detergent solution should be performed. Mop heads should be machine laundered and thoroughly dried daily.

4.6.1.6.3 Cabinet counters, work surfaces, and similar horizontal areas should be cleaned once a day with an approved MOH intermediate-level disinfectant/detergent and clean cloths; as they may be subject to heavy contamination during routine use.

4.6.1.6.4 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.

4.6.1.6.5 Friction cleaning is important to ensure the physical removal of dirt and contaminating microorganisms.

4.6.1.6.6 In case of outbreaks, infection control practitioner should supervise all environmental cleaning and disinfection procedures

4.6.1.6.7 Environmental cleaning should be done according to the approved cleaning schedule and with a cleaning checklist to ensure the quality of the process.

4.6.1.6.8 Environmental terminal cleaning equipment (H202 and ultraviolet) are preferred to be used in terminal cleaning.

4.6.1.7 Disinfection of Equipment between Patients:

4.6.1.7.1 All equipment should be cleaned and disinfected between patients.

4.6.1.7.2 Equipment in direct contact with the skin or mucous membranes of newborns should be sterilized or undergo decontamination with MOH approved high-level disinfectant.

4.6.1.7.3 Examination equipment, such as stethoscopes and ophthalmoscopes, should be reserved for use with one patient (if available) or decontaminated with alcohol or other MOH disinfectant approved for this equipment.

4.6.1.7.4 Equipment that is not in direct contact with skin or mucous membranes should be cleaned with an approved MOH detergent disinfectant.

4.6.1.8 Incubators Cleaning and Disinfection:

4.6.1.8.1 A cleaning schedule should be prepared and applied.

4.6.1.8.2 Incubator cleaning process preferably to be done in a dedicated place.

4.6.1.8.3 The inside and outside surfaces of the incubators should be cleaned daily using hospital approved disinfectant and according to manufacture recommendations.

4.6.1.8.4 Incubators should be disinfected between each baby.

4.6.1.8.5 After use, all removable parts must be washed and thoroughly cleaned with detergent.

4.6.1.8.6 Rinse and dry thoroughly using disposable paper towels.

4.6.1.8.7 The incubator should also be cleaned and dried.

4.6.1.8.8 All parts of the incubator should be disinfected using chlorine (200-500 ppm).

4.6.1.8.9 Aerate the incubator before re-use.

4.6.1.8.10 Adhesive tape should not be used to stick baby information's label.

4.6.1.8.11 Clean incubators should be stored properly.

4.6.1.8.12 Incubator cover should be changed any time if soiled, moist, and every 7 days.

4.6.1.9 Linen Cleaning and Disinfection between Patients:

4.6.1.9.1 Linen for new-borns does not need to be autoclaved.

4.6.1.9.2 Clean linen should be wrapped or covered during transport from the laundry and stored in closed cabinets to prevent dust contamination.

4.6.1.9.3 Used linen should be handled as little as possible to avoid hand contamination and aerosolization of microorganisms.

4.6.2 Isolation (transmission Based) Precautions:

4.6.2.1 In addition to standard precautions, some infections require additional measures for (Contact, Airborne, and Droplet) to prevent transmission of microorganisms.

4.6.2.2 A newborn patient infected or colonized with microorganisms need isolation precautions, it is not necessary to be placed in a single isolation room if:

4.6.2.2.1 The infection is not airborne transmitted.

4.6.2.2.2 There is an adequate number of HCWs with sufficient time for proper hand hygiene.

4.6.2.2.3 There is sufficient space (2.44) meters between newborn stations.

4.6.2.2.4 There is an adequate number of hand hygiene sinks.

4.6.2.3 Neonates exposed to varicella-zoster or neonates with signs or symptoms of congenital tuberculosis (TB) or any other airborne transmitted infection should be cared and isolated in a negative air pressure room.

4.7 Specific Infection Prevention and Control Measures in NICU:

4.7.1 Umbilical Cord Care

4.7.1.1 Natural cord drying is recommended with a focus on keeping clean and dry.

4.7.1.2 It is not recommended to use topical antiseptics or antibiotics.

4.7.2 Skin Care

4.7.2.1 Maternal blood and meconium should be removed with sterile cotton sponges and warm water.

4.7.2.2 Heat loss should be minimized to ensure temperature stability.

4.7.2.3 HCW should implement Contact Precautions and wear gloves with all handling of the neonate until the initial skin cleansing has been performed.

4.7.2.4 Cleaning of the diaper area and other soiled areas by using warm water with or without a mild soap are sufficient throughout the nursery stay

4.7.2.5 Any agent used should be provided in containers reserved for use with an individual infant.

4.7.2.6 Bathing with an antiseptic agent is indicated in an outbreak if the benefit outweighs the potential risk of toxicity.

4.7.2.7 Irritation to the newborn skin by excessive drying, manipulation, or other trauma should be minimized and avoided.

4.7.3 Eye (Conjunctival) Care:

4.7.3.1 At delivery, the eyes of the neonate should be cleaned with sterile cotton to remove secretions and debris.

4.7.3.2 Use separate sterile cotton for each eye.

4.7.3.3 Topical prophylaxis against neonatal eye infection (gonococcal ophthalmic neonatorum) should be administered (describe by a physician) within 1 hour of birth or immediately after the initial breastfeeding in the delivery room.

4.7.3.4 When use eye drops or ointment start from clean to dirty eyes to prevent crosscontamination.

4.7.3.5 Care should be taken (e.g. apply gauze before suction) to avoid contamination of the eyes with respiratory tract secretions during suctioning of the nasopharynx or endotracheal tube.

4.7.3.6 Early signs of conjunctivitis should be reported.

4.7.4 Infant Feeding:

4.7.4.1 If a breast pump is used, all pump components that are in contact with milk should be washed with hot soapy water after each use, dried, and stored in a clean place.

4.7.4.2 Pump components should be sterilized or disinfected when uses by different mothers

4.7.4.3 Pump components should be daily sterilized or disinfected when used by only one mother.

4.7.4.4 Storage duration of the milk for room temperature is 3 to 4 hours

4.7.4.5 Storage duration of the milk for a refrigerator (4^0C or below) is 72 hours

4.7.4.6 Storage duration of the milk for the freezer (below -17^0C) is 6 -12 months

4.7.4.7 Milk should not be excessive heat by hot water or a microwave oven.

4.7.4.8 Milk should be used immediately or stored in the refrigerator for no longer than 24 hours after thawing

4.7.4.9 When milk is removed from the refrigerator, feeding should be completed within 4 hours.

4.7.4.10 If breast milk stored in the NICU protocol should be established for proper identification of the milk to prevent being fed milk from mother other than their one, policy should be in place for management and follow-up events

4.7.4.11 Microbiological testing is necessary when neonates have gastrointestinal intolerance or sepsis is suspected

4.7.4.12 Formula made from liquid concentrates or powders must be prepared using aseptic techniques.

4.7.4.13 Water used for dilution or reconstitution should be sterile, and equipment should undergo sterilization or disinfection before use

4.7.4.14 The formula should be bottled in quantities required for individual feeds or 4 hours of continuous feeding, should be stored refrigerated for a maximum of 24 hours

4.7.4.15 If feeds must be prepared in the nursery, care should be taken to do so aseptically in a designated clean area of the nursery (Breast milk preparation rooms are recommended).

4.7.5 Traffic in NICU:

4.7.5.1 NICU should be low traffic and restricted access.

4.7.5.2 Keep traffic (visitors, parents, and staff) to an absolute minimum while HCWs perform sterile/aseptic procedures.

4.7.5.3 All visitors, parents, and staff are required to perform hand hygiene prior to any contact with infants/infant care environment.

4.7.5.4 Encore age parents, visitors, and staff to wipe all electronic devices (e.g. cell phones, Pads) with alcohol-based wipes prior to entering the NICU.

4.8 Prevention of Infection Transmission from the Mother to Neonate:

4.8.1 A mother with a communicable infection should wash her hands before handling her infant.

4.8.2 A mother with influenza should wear a surgical mask while breastfeeding and when within 3 feet of her newborn.

4.8.3 A mother with varicella may remain with her once the infant has received Varicella Zoster Immuno- Globulin (VZIG).

4.8.4 Mothers with Herpes Simplex Virus (HSV) lesions around nipples should not breastfeed until the lesions have resolved.

4.8.5 A mother with untreated active pulmonary TB should be separated from her newborn until she is considered noninfectious (received adequate antimicrobial therapy).

4.8.6 A mother with group A streptococcus infection should be separated until appropriate antibiotic therapy has been started.

4.8.7 A mother with HBV or HCV is not a contraindication to contact and breastfeed her baby.

4.8.8 Breastfeeding is not contraindicated with mothers under antibiotic therapy for simple mastitis but contraindicated with cases of breast abscess.

4.8.9 A mother with group A streptococcus infection should be separated until appropriate antibiotic therapy has been started and the infection is no longer considered communicable.

4.8.10 Separation also should be considered if a mother has an extensive S. aureus infection with drainage that cannot be contained by dressings.

4.8.11 Maternal HIV infection is a contraindication to breastfeeding.

4.9 Neonate with Congenital Cytomegalovirus (CMV):

4.9.1 A pregnant woman can pass CMV to her unborn baby through the placenta if the pregnant woman is infected with CMV.

4.9.2 The saliva and urine of neonates with CMV have high amounts of the virus.

4.9.3 Apply contact precaution for the neonate with (CMV).

4.9.4 Use detected equipment for the neonate with (CMV).

4.9.5 Wash your hands after changing diapers.

4.10 Prevention of Transmission to land from Health Care Workers:

4.10.1 Standard Precautions should be applied to minimize the risk of potential infection with bloodborne viruses.

4.10.2 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.

4.10.3 HCWs with exudative or herpetic hand lesions should not have direct patient contact or handle patient care equipment.

4.10.4 Wearing a mask can prevent the touching of oral lesions.

4.10.5 HCWs with airborne infections should not work.

4.10.6 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.

4.11 Prevention of Transmission from the Inanimate Environment:

4.11.1 The NICU should be kept clean and dust-free.

4.11.2 Floors, work surfaces, and other horizontal surfaces should be cleaned daily with the MOH approved environmental hospital disinfectant.

4.11.3 Walls, curtains, and window blinds should be cleaned sufficiently often to prevent the accumulation of dust.

4.11.4 Equipment assigned to a single patient with a prolonged stay should be changed and cleaned periodically.

4.11.5 Contact with a neonate's non-intact skin or mucous membranes (e.g., resuscitation bags, masks) should be replaced and undergo sterilization or high-level disinfection on a regular basis.

4.11.6 Toys should not be placed in incubators.

4.12 Elimination of Sources of Waterborne Pathogens:

4.12.1 In NICU should not be used evaporative humidifiers in incubators if central humidification provides sufficient humidity.

4.12.2 The water reservoir should be drained when used, cleaned, and refilled with sterile water every 24 hours.

4.12.3 Nebulizers and attached tubing and water traps should be replaced regularly with equipment that is sterile or that has undergone high-level disinfection.

4.12.4 Sterile water should be used in nebulizers and humidifiers.

4.12.5 Condensate in ventilator tubing should be drained and discarded periodically.

4.13 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, either isolated or cohorted.

4.13.4 Cohorts should be maintained until all infected and exposed infants are discharged

4.13.5 Surveillance for infection may need to be extended to recently discharged infants, especially in newborn nurseries, where discharge may occur during the incubation period

4.14 Care Prevention Bundle for Invasive Devices Used in NICU:

Components of Central Line (Insertion) Bundle:

4.14.1 Hand hygiene: When caring for central lines, indications for hand hygiene including:

4.14.1.1 Before and after palpating catheter insertion sites (Palpation of the insertion site should not be performed after the application of antiseptic unless the aseptic technique is maintained)

4.14.1.2 Before and after inserting, replacing, accessing, repairing, or dressing an intravascular catheter

4.14.2 Maximal barrier precautions

4.14.2.1 Apply maximal barrier precautions in preparation for line insertion.

4.14.2.2 For the operator placing the central line and for those assisting in the procedure.

4.14.2.3 Maximal barrier precautions mean strict compliance with hand hygiene and wearing a cap, mask, sterile gown, and sterile gloves.

4.14.2.4 The cap should cover all hair and the mask should cover the nose and mouth tightly.

4.14.2.5 These precautions are the same as any other surgical procedure that carries a risk of infection.

4.14.2.6 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.

4.14.3 Chlorhexidine skin antisepsis

4.14.3.1 Prepare skin with antiseptic/detergent chlorhexidine 2% in 70% isopropyl alcohol.

4.14.3.2 Pinch wings on the chlorhexidine applicator to break open the ampule.

4.14.3.3 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).

4.14.3.4 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.

4.14.3.5 Allow antiseptic solution time to dry completely before puncturing the site (2 minutes).

4.14.4 Optimal catheter site selection, with subclavian vein as the preferred site for nontunnelled

4.14.4.1 Several non-randomized studies show that the subclavian vein site is associated with a lower risk of CLABSI than the internal jugular vein.

4.14.4.2 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.

4.14.4.3 In these instances, teams are considered compliant with the bundle element as long as they use a rationale construct to choose the site.

4.14.4.4 The physician must determine the risks and benefits of using any vein.

4.14.5 Catheters.

4.14.6 Daily review of line necessity, with prompt removal of unnecessary lines.

4.15 Components of Central Line Maintenance Bundle:

4.15.1 Hand hygiene before catheter access/manipulation

4.15.2 Daily review/assessment of catheter necessity with prompt removal of unnecessary lines.

4.15.3 Proper dressing choice:

4.15.3.1 Replace transparent dressing every 7 days.

4.15.3.2 Replace gauze dressing every 48 hours.

4.15.3.3 Replace immediately any dressing that is soiled, dampened, or loosened.

4.16 Umbilical Catheters

4.16.1 Remove and do not replace umbilical artery catheters if any signs of CRBSI, vascular insufficiency in the lower extremities, or thrombosis are present.

4.16.2 Remove and do not replace umbilical venous catheters if any signs of CRBSI or thrombosis are present.

4.16.3 No recommendation can be made regarding attempts to salvage an umbilical catheter by administering antibiotic treatment through the catheter.

4.16.4 Cleanse the umbilical insertion site with an antiseptic before catheter insertion. Avoid tincture of iodine because of the potential effect on the neonatal thyroid.

4.16.5 Do not use topical antibiotic ointment or creams on umbilical catheter insertion sites because of the potential to promote fungal infections and antimicrobial resistance.

4.16.6 Heparin (0.5 U/ml) should be added when infusion is through a central line.

4.16.7 Remove umbilical catheters as soon as possible when no longer needed or when any sign of vascular insufficiency to the lower extremities is observed. Optimally, umbilical artery catheters should not be left in place >5 days.

4.16.8 Umbilical venous catheters should be removed as soon as possible when no longer needed but can be used for up to 14 days if managed aseptically.

4.16.9 An umbilical catheter may be replaced if it is malfunctioning, and there is no other indication for catheter removal, and the total duration of catheterization has not exceeded 5 days for an umbilical artery catheter or 14 days for an umbilical vein catheter.

4.17 Ventilator Bundle in Neonatal Population:

4.17.1 Spray laryngoscope blade after each patient use with enzymatic detergent then sent to CSSD for sterilization.

4.17.2 Elevation of the head of the bed the angle is modified 15 – 30 degrees for neonates

4.17.3 Daily assessment of readiness to extubate daily "sedative interruption" is not recommended due to the high risk of unplanned extubation.

4.17.4 Daily oral care:

4.17.4.1 Should be more gentle

4.17.4.2 0.12% chlorhexidine oral rinse only for children greater than 2 months of age.

4.17.5 Keep the ventilator circuit free from condensate by draining water away every 2 – 4 hours

4.17.5.1 Drain condensate away from the patient and especially prior to repositioning.

4.17.5.2 Consider heated vent circuits which decrease the occurrence of condensate.

4.17.5.3 Circuit changes should take place only when it is visibly soiled or mechanically malfunctioning.

4.17.5.4 Use meticulous hand hygiene before and after contact with ventilator circuits.

4.17.6 Change in-line suction catheter systems only when soiled or otherwise indicated; open catheter systems should be considered single-use.

4.17.7 Store oral suction devices in a clean non-sealed plastic bag when not in use.

4.18 Surveillance:

4.18.1 Useful in identifying colonization of infants for implementation of Transmission-based Precautions to reduce transmission of these organisms in a closed environment.

4.18.2 Most common screening depends on patient rejoin, e.g., MRSA, CRE

4.18.3 Should use physical separation of infected and colonized patients from other patients and the use of appropriate hand hygiene.

4.18.4 MRSA screening must be done for all patients admitted to NICU

4.18.5 Carbapenem-resistant Enterobacteriaceae (CRE) screening must be done for all patients admitted to NICU

4.18.6 For the Clearance/Discontinuation of Isolation, please refer to (GCC infection prevention and control manual 2018)

4.19 Dress Code (Attire in NICU):

4.19.1 Dress codes should be established for regular and part-time HCWs and supportive servicespersonnel who enter the neonatal unit.

4.19.2 No white coats, jackets, or warmers should be worn while providing direct Clinical care (during clinical procedures - invasive and non-invasive, procedure examinations or providing care).

4.19.3 No need for wearing special shoes or overshoes prior to enter NICU units.

4.19.4 When wearing street clothes, proper care must be taken to adhere to strict handwashing practices with soap and water or an alcohol-based waterless hand gel before and after, each or every patient contact

4.19.5 When entering an Isolette, sleeves should be above the elbows during any patient care. Push sleeves up above the elbows when having contact with babies in isolettes.

4.19.6 All staff in direct patient care (during clinical procedures, examinations or providing nursing care) should keep arms bare to the elbows (sleeves are rolled up to the elbows) so no contact is made with any personal clothing

4.19.7 Sterile long-sleeved gowns must be worn by all personnel who have direct contact with the sterile field during surgical and invasive procedures in the neonatal unit.

4.19.8 Gloves are to be worn when handling the neonate until blood and amniotic fluid have been removed from the skin.

4.19.9 All staff in direct contact with patients or their surroundings should have no wristwatches, rings, or bracelets on.

4.19.10 All NICU staff should have their hair covered or tied neatly at the back above the shoulder line.

4.19.11 Headscarves should be shoulder length at most and must be secured neatly. Scarves should not drape freely when providing direct patient care.

4.19.12 All NICU staff should minimize the use of mobile phones and should keep their phones hidden in pockets or bags at all times to avoid getting them in direct contact with patients' surroundings and working surfaces.

4.19.13 Artificial fingernails nail extenders, and nail polish (coloured or clear) are prohibited in NICU.

4.19.14 For mothers to breastfeed, the yellow gown can be worn with the opening at the front to allow breastfeeding.

4.19.15 Before starting kangaroo care:

4.19.15.1 Educate the staff regarding S. aureus

4.19.15.2 Staff and mother must apply hand hygiene

4.19.15.3 Clean and dry mother intact skin

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 IPCD and all Healthcare providers working in NICU and its design.

7. APPENDICES:

7.1 N/A

8. REFERENCES:

8.1 General Directorate of Infection Prevention and Control in Healthcare Facilities (GDIPC) Infection Control Guidelines in the Neonatal Intensive Care Unit (NICU) 1st Edition 1442 – 2021

9. APPROVALS:

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