HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

Department:	Infection Prevention and Control Department		
Document:	Multidisciplinary Policy and Procedure (MPP)		
Title:	Guidelines for the Prevention of Surgical Site Infection (SSI)		
Applies To:	All MCH Department		
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1. PURPOSE:

1.1 To provide and standardize the knowledge and practice of new and updated evidence-based recommendations for preventing SSI for all concerned HCWs.

2. DEFINITONS:

2.1 Surgical Site Infection (SSI): Infection occurs within 30 or 90 days (according to the operative procedures) after an operative procedure that involves the skin or subcutaneous tissue (superficial incisional SSI), deep soft tissue (deep incisional SSI), or any other part of the body that is opened or manipulated during the operative procedure (organ/space SSI).

2.2 Bundle is an implementation tool aiming to improve the care process and patient outcomes in a structured manner. It comprises a small, straightforward set of evidence based practices (generally 3 to 5) that have been proven to improve patient outcomes when performed collectively and reliably.

2.3 Surgical bundle: A group of evidence-based interventions for patients undergoing surgery that, when implemented together, result in better outcomes (reduce SSI) than when implemented individually.

2.4 Patients' care bundles are the series of evidence-based practices / interventions related to devices or process of care that, when implemented together, will achieve significantly better outcomes than when implemented individually

2.5 Compliance with the any bundle is defined as the percentage of patients who have received all elements of the bundle with documentation in daily goals sheets . bundle forms. and/or elsewhere in the medical record.

3. POLICY:

3.1 Strict adherence to recommended practices is of utmost importance for prevention of surgical site infections in patients undergoing surgical procedures.

3.2 IPC department hold responsibility to monitor and track implementation of surgical bundle in all relevant units.

3.3 Daily implementation of patient care bundles is the responsibility of nursing staff of critical care units.

3.4 Implementation of surgical bundle is the shared responsibility of concerned departments during preoperative. Intraoperative & post operative phases.

3.5 Applies bundle of care for prevention of surgical site infections including proper antimicrobial prophylaxis, no preoperative hair removal or use of electric hair clippers if hair removal is necessary, controlled 6 AM postoperative serum glucose, maintaining perioperative normothermia, patient full body shower at least the night before surgery with antimicrobial soap, and intraoperative skin preparation with approved antiseptic.

3.6 A competency-based training program for surgical care improvement including surgical site infections prevention care bundle (preoperative, Intraoperative & post operative phases

3.6.1 NOTE: This is an "ALL-OR-NONE" INDICATOR. If any of the elements are not documented, the patient is not counted in the numerator. If a bundle e element is contraindicated for a particular patient and this is documented appropriately in the medical record, then the patient is considered compliant with regard to that measure.

3.7 The IPC will analyze SSI compliance based on Data Analysis: See appendices 7.1

3.8 Data on care bundles will be collected, analyzed, interpreted, and disseminated with necessary correction actions when needed. The IPC department provides compliance audit feedback to the surgical HCWs regarding their performance in surgical site infections prevention care bundle regularly and corrective actions are applied accordingly.

3.8 Data Analysis: (Surgical Bundle Compliance)

3.8.1 Calculate Bundle compliance for individual element would guide towards targeted corrective interventions in case of low compliance).

FORMULA: Surgical Bundle Compliance :

=Surgical patients compliant to all applicable components of the surgical bundle ÷ Total number of surgical patients reviewed for the bundle compliance X 100

3.8.2 Procedure specific measure

$$\text{SSI Rates} = \frac{\text{The number of SSIs detected after a procedure}}{\text{Total number of that procedures examined}} \times 100$$

4. PROCEDURE:

4.1 Surgical Site Infection (SSI) Prevention Recommendations

4.2 Pre-Operative Measures:

4.2.1 Risk assessment:

4.2.1.1 The patient should be categorized as low, medium, or high risk for developing SSI.

4.2.1.2 Several scales can assess the risk of SSI: the Brompton Harefield Infection Score (BHIS), the Australian Clinical Risk Index (ACRI), the Infection Risk Index in Cardiac Surgery (IRIC), the Gatti score, the Northern New England Cardiovascular Disease Study Group prediction rule for mediastinitis, the Friedman score, the Alfred Hospital risk index A.

4.2.2 Preoperative Antiseptic Patient Showering:

4.2.2.1 Patients should bath or shower the night before and on the day of the surgery using 4% Chlorhexidine soap for patients >2 months and above; this is generally done with an antimicrobial soap or Chlorhexidine Gluconate (CHG) impregnated cloths (usually CHG 4% combined with a detergent or in a Triclosan preparation).

4.2.2.2 CHG reduces bacterial colony counts nine-fold compared with other cleaning measures.

4.2.3 Preoperative Hair Removal:

4.2.3.1 Preoperative shaving of the surgical site the night before an operation is associated with a significantly higher SSI risk than either the use of depilatory agents or no hair removal.

4.2.3.2 The increased SSI risk associated with shaving has been attributed to microscopic cuts in the skin that later serve as foci for bacterial multiplication.

4.2.3.3 If shaving was performed >24 hours before the operation, the SSI rate exceeded 20%.

4.2.3.4 Clipping hair immediately before an operation has also been associated with a

lower risk of SSI than shaving or clipping the night before an operation (SSI rates
immediately before = 1.8% vs night before = 4.0%).

4.2.3.5 Studies have shown that preoperative hair removal by any means was associated with increased SSI rates and suggested that no hair be removed.

4.2.3.6 Removal of hair should be done using mechanical hair clippers.

4.2.3.7 Do not remove hair in the operating room (OR) except if the patient is already
anesthetized and on the operating table when hair is discovered on the preoperative site; hair removal may be done.

4.2.3.8 If hair removal is ordered, use clippers with a disposable head; hair removal shall
be performed on the ward as close as possible to the time of surgery.

4.2.3.9 After each patient, ensure the clipper handle is wiped down with a disinfectant
(e.g., alcohol wipes).

4.2.3.10 Hair removal may be done in the holding area but not in the OR for cases coming
directly from the Emergency Department. Ensure loose hairs are removed entirely after removal.

4.2.3.11 Minimal hair removal is allowed in the OR for patients going for neurosurgery or
from the cath-lab to cardiac surgery OR in life-saving cases.

4.2.3.12 Ensure loose hairs after removal are removed completely.

4.2.3.13 NOTE:

4.2.3.13.1 Hair should not be removed at the operative site unless the presence of hair will interfere with the operation.

4.2.3.13.2 Do not use razors. If hair removal is necessary, remove hair outside the OR using a clipper with a single-use head.

4.2.4 Patient Skin Preparation in the Operating Room (OR) (Surgical Site Preparation):

4.2.4.1 Several antiseptic agents are available for preoperative skin preparation at the
incision site, including alcohol-based antiseptic solutions containing CHG for
surgical site skin preparation for patients undergoing surgical procedures.

4.2.4.2 CHG 2% in isopropyl 70% alcohol solution is used for surgical site skin preparation.

4.2.4.3 CHG solutions should not be used on neonates or be in contact with themucosa or eyes.

4.2.4.4 CHG solutions must not be allowed to contact the brain, meninges, eye, or middle ear.

4.2.4.5 Use Povidone Iodine (PVP-I) 10% with alcohol for surgical site skin preparation for patients who are allergic to CHG.

4.2.4.6 CHG reduced skin microflora more than povidone-iodine and had more excellent residual activity after a single application.

4.2.4.7 CHG is not inactivated by blood or serum proteins, but Iodophors may be inactivated by blood or serum proteins.

4.2.4.8 Before the skin preparation of a patient is initiated, the skin should be free of gross contamination (i.e., dirt, soil, or any other debris).

4.2.4.9 The prepared area should be large enough to extend the incision or create new
incisions or drain sites. The application of the skin preparation may need

to be
modified depending on the skin condition (e.g., burns) or the location of the
incision site (e.g., face).

4.2.5 Preoperative Hand/Forearm Antisepsis (Surgical Hand Preparation):

4.2.5.1 Surgical hand preparation is vitally important to maintain the lowest possible
contamination of the surgical field, especially in the event of a sterile glove
puncture during the procedure. Appropriate surgical hand preparation is highly
recommended.

4.2.5.2 The spectrum of antimicrobial activity for surgical hand preparation against
bacteria and fungi should be as broad as possible.

4.2.5.3 Rings, watches, and bracelets should be removed before the surgical hand scrub begins.

4.2.5.4 Debris underneath fingernails should be removed using a nail cleaner under
running water.

4.2.5.5 The operating team should wash their hands before the first operation on the list
using an aqueous antiseptic surgical solution and ensure that hands and
nails are visibly clean with a single-use brush or pick for the nails.

4.2.5.6 Before subsequent operations, hands could be rubbed using an Alcohol-Based
Hand Rub (ABHR) or washed with an antiseptic surgical solution.

4.2.5.7 Hands that are soiled should be rewashed with an antiseptic surgical solution.

4.2.5.8 When performing surgical hand antisepsis using an antimicrobial soap, scrub hands and forearms for 2 to 5 minutes.

4.2.5.9 Bacteria in the hands of surgeons can cause wound infections if introduced into
the operative field during surgery.

4.2.5.10 If hands are washed with a non-antimicrobial soap, bacteria rapidly multiply under surgical gloves.

4.2.5.11 Gloves should also be changed at least once every 60 to 90 minutes, as contamination and glove perforation rates increase with surgery duration, even
using double gloves.

4.2.5.12 Bacterial growth is slowed after preoperative scrubbing with an antiseptic agent.

4.2.5.13 Reducing resident skin flora on the hands of the surgical team for the duration of
a procedure reduces the risk of bacteria being released into the surgical field if
gloves become punctured or torn during surgery.

4.2.5.14 Scrub solution dispensing containers should be:

4.2.5.14.1 Scrub solution dispensing containers should not be open and should have a lid.

4.2.5.14.2 Single-use containers are recommended, and they should be discarded when empty according to healthcare facility policy.

4.2.5.14.3 The container should never be refilled or what is

referred to as "topping off." Refilling or topping off without first decontaminating the container can cause contamination of the scrub solution and container, thus contributing to the risk of cross-contamination.

4.2.5.15 The healthcare facility should provide an MOH-approved scrub solution with immediate, cumulative, and persistent antimicrobial action for use by the surgical personnel.

4.2.5.16 Surgical hand antisepsis should be performed using either an antimicrobial soap or a waterless alcohol-based hand rub with persistent activity before donning sterile gloves when performing surgical procedures.

4.2.5.17 Alcoholic chlorhexidine (0.5% CHG in 70% isopropanol) was found to have more significant residual antimicrobial activity.

4.2.5.18 Before applying the alcohol-based solution, hands and forearms should be prewashed with a non-antimicrobial soap and dry hands and forearms completely.

4.2.5.19 After applying the waterless alcohol-based product, hands, and forearms should be allowed to dry before donning the sterile gloves.

4.2.5.20 Surgical Hand Preparation Technique with an Alcohol-Based Hand Rub Formulation: See Policy and Procedure 013 Hand Hygiene.

4.2.6 Management of Infected or Colonized Surgical Personnel:

4.2.6.1 Surgical personnel who have active infections or are colonized with certain microorganisms have been linked to outbreaks or clusters of SSIs.

4.2.6.2 Decolonize surgical patients with an anti-staphylococcal agent in the preoperative setting for orthopedic and cardiothoracic procedures

4.2.6.3 Healthcare organizations must implement policies to prevent the transmission of microorganisms from personnel to patients.

4.2.6.4 When necessary, exclusion of ill personnel from work or patient contact.

4.2.6.5 Note: Decolonization for the Prevention of Staphylococcus aureus Infection in Nasal Carriers Undergoing Surgery:

4.2.6.5.1 Screening should be done for Methicillin Sensitive Staphylococcus aureus (MSSA) and Methicillin Resistant Staphylococcus aureus (MRSA) and decolonize surgical patients for high-risk procedures, including some orthopedic and cardiothoracic procedures.

4.2.6.5.2 Decolonization with mupirocin ointment with or without CHG body wash for the prevention of Staphylococcus aureus infection in nasal carriers.

4.2.6.5.3 Patients undergoing cardiothoracic and orthopaedic surgery with known nasal carriage of S. aureus should receive perioperative intranasal applications of mupirocin 2%.

4.2.6.6 Exclusion policies should be enforceable and include a statement of authority to exclude ill personnel; they should also be designed to encourage personnel to report their illnesses and exposures.

4.2.7 Preoperative Surgical Parenteral Antimicrobial Prophylaxis (AMP):

4.2.7.1 Surgical antimicrobial prophylaxis (AMP) refers to a brief course of an antimicrobial agent initiated just before an operation begins.

4.2.7.2 Administer single-dose preoperative antimicrobial agents only when indicated based on National Antimicrobial Therapy guidelines for the Community.

4.2.7.3 Note: For further information on National Antimicrobial Therapy guidelines for the Community read theMOH list of antibiotics for surgical prophylaxis and timed (see appendix 1) so that a bactericidal concentration of the agents is established in the serum and tissues when the incision is made.

4.2.7.4 Administer the appropriate parenteral prophylactic antimicrobial agents before skin incision in all cesarean section procedures, a single dose of antibiotic intravenously within 60 minutes before incision.

4.2.7.5 If a tourniquet is to be applied, 15 minutes is required between the end of antibiotic administration and tourniquet application.

4.2.7.6 Due to the longer infusion time required for Vancomycin and fluoroquinolones, starting these antibiotics within 2 hours before incision is acceptable.

4.2.7.7 A single dose of antibiotics is considered sufficient for most procedures.

4.2.7.8 Repeat doses are indicated for procedures lasting more than 4 hours (2 half-lives antimicrobial of agents) or those with significant blood loss (>1,500mL) or massive hemodilution after cardiopulmonary bypass in cardiac surgery.

4.2.7.9 Increase dosing of prophylactic antimicrobial agents for morbidly obese patients. Adjust dosing based on the patient's weight.

4.2.7.10 Prophylactic antibiotics should be discontinued after incisional closure in the OR.

4.2.7.11 Some guidelines suggest stopping the antimicrobial agents within 24 hours of surgery, but this doesn't add benefits more than stopping after incisional closure.

4.2.7.12 Antibiotics given after closure contribute to increased antimicrobial resistance and increased risk of Clostridium difficile infection and acute kidney injury.

4.2.8 Glycemic Control:

4.2.8.1 Perioperative hyperglycemia has been associated with a higher incidence of SSI in patients undergoing surgery.

4.2.8.2 More specifically, hyperglycemia during the immediate postoperative period was an independent risk factor for infections among patients, with the risk of infection

correlating with the degree of glucose elevation.

4.2.8.3 Glucose level control has been associated with a decrease in SSI.

4.2.8.4 Implement perioperative glycemic control and use blood glucose target levels less than 150 mg/dl before, during, and after the procedure for the first two postoperative days in patients with and without diabetes.

4.3 Intra-Operative Measures:

4.3.1 Operating Room (OR) Ventilation:

4.3.1.1 OR should be maintained at positive pressure to corridors and adjacent areas.

4.3.1.2 The pressure gradient must provide an airflow direction from the OR to the surrounding areas to prevent infection. Positive pressure prevents airflow from less clean areas into more clean areas.

4.3.1.3 Terminal filters at the point of entry to the OR should be high-efficiency particulate air (HEPA) or ultra-lowpenetrating air (ULPA) filters,with provision for testing filter integrity.

4.3.1.4 Air should be introduced at the ceiling and exhausted near the floor with a minimum of four exhaust or return air intake grilles should be located in the corners of the OR, approximately 200mm above floor level.

4.3.1.5 Temperature ranges from 20 to 24 Celsius, relative humidity ranges from 20-60%, positive pressure +2.5 Pascal is a minimum, air change per hour is 15 ACH, and a minimum of 20% is fresh air.

4.3.1.6 The ventilation system of the OR should be continuously operated 24/7 and never be shut down except for ventilation system maintenance, as closing and sudden activation of the ventilation system in the OR cause rapid air turbulence that stirs air particles to be airborne and can cause SSI for the first patient.

4.3.1.7 Laminar airflow and the use of UV radiation have beenmeasures to reduce SSI risk.

4.3.1.8 Laminar airflow moves particle-free air (ultraclean air) over the aseptic operating field at a uniform velocity (0.3 to 0.5 µm/sec), sweeping away particles in its path and recirculated air is usually passed through a (HEPA) filter that removes particles > 0.3 µm in diameter with an efficiency of filtration 99.97%.

4.3.1.9 Routine bacteriological monitoring of ambient air by air sampling and cultures epidemiologic investigation is not required. Still, it may be helpful to establish the potential source of an outbreak for educational purposes or after OR construction and before reopening.

4.3.2 Operating Room (OR) Environmental surfaces: General Principles of OR Environmental Cleaning:

4.3.2.1 Cleaning is essential before any disinfection process to remove dirt, debris, and other materials.

4.3.2.2 The use of a neutral detergent solution is essential for effective cleaning. It

removes dirt while improving the quality of cleaning by preventing the build-up of
biofilms and thus increasing the effectiveness of chemical disinfectants.

4.3.2.3 If disinfectants are used, they must be prepared and diluted according to the
manufacturer's Instructions; too high and too low concentrations reduce the
effectiveness of disinfectants. In addition, high concentrations of disinfectant may
damage surfaces.

4.3.2.4 Cleaning should always start from the least soiled areas (the cleanest) first to the
most soiled areas (the dirtiest) last and from higher levels to lower levels so that
debris may fall on the floor and is cleaned last.

4.3.2.5 Detergent and disinfectant solutions must be discarded after each use.

4.3.2.6 Avoid cleaning methods that produce mists or aerosols or disperse dust, such as dry sweeping, mopping, spraying, or dusting.

4.3.2.7 Routine bacteriological monitoring to assess the effectiveness of environmental
cleaning is not required but may be helpful to establish the potential source of an
outbreak and for educational purposes.

4.3.2.8 OR Cleaning happens at various times:

- 4.3.2.8.1 Every day, before surgery begins.
- 4.3.2.8.2 Between patients.
- 4.3.2.8.3 After the last operation of the day (known as terminal cleaning).
- 4.3.2.8.4 Deep cleaning is done once a week and once a month.

4.3.2.9 All areas must be cleaned: unrestricted, semi-restricted, and restricted areas. Start in the operating theatre beforemoving to the scrub areas, anesthetic, and recovery rooms.

4.3.2.10 The toilets should be cleaned last.

4.3.2.11 All surgical lights and horizontal surfaces of the furniture, equipment, walls, and
floors should be cleaned and disinfected with MOH-approved intermediate-level
disinfecting according to manufacturer recommendations.

4.3.2.12 All spills must be carefully cleaned and the surface cleaned and disinfected
according to hospital policy.

4.3.2.13 At the end of every day, it is necessary to perform a total cleaning procedure. All
areas of the surgical suite, scrub sinks, scrub or utility areas, hallways, and
equipment should be thoroughly cleaned, regardless of whether they were used
or not during the last 24 hours.

4.3.2.14 Soiled linen should be removed in closed, leak-proof containers.

4.3.2.15 All contaminated waste containers should be removed and replaced with clean
containers.

4.3.2.16 Sharps' containers should be closed, removed when they are three-quarters full,

and replaced with new ones.

4.3.3 Proper Surgical Attire:

4.3.3.1 Surgical attire that should be worn in the semi-restricted and restricted areas of the surgery department includes the head cover, masks, scrub suits, and shoes.

4.3.3.2 The surgical team members are responsible for preventing SSI by properly donning and wearing the appropriate head cover or hood.

4.3.3.3 Clean scrub attire that fits well should be worn in restricted or semi-restricted procedural areas.

4.3.3.4 When choosing scrub material, consider the containment of shed skin particles and comfort. Establish and implement a process for laundering scrubs regularly and whenever they become visibly soiled.

4.3.3.5 Change out of visibly soiled scrub attire as soon as possible without delaying exigent patient care

4.3.3.6 Cover the hair and scalp with headgear made of disposable or launderable reuseable material when in a restricted or semi-restricted procedural area.

4.3.3.7 When choosing headgear material, consider the containment of shed particles, comfort, and fit.

4.3.3.8 Establish and implement a process for laundering reusable head coverings regularly and whenever they become visibly soiled.

4.3.3.9 This does not apply to the insertion of cannulas into superficial peripheral veins for short-term (less than three days) intravenous access.

4.3.3.10 When in a restricted or semi-restricted procedural area, cover facial hair not contained within a mask, especially when working over or near the surgical field.

4.3.3.11 When choosing a facial hair covering material, consider containment of shed particles, comfort, and fit.

4.3.3.12 During a procedure where normally sterile surfaces or mucous membranes are exposed or entered through a needle or cannula, wear a surgical mask that covers the mouth and nose fully.

4.3.3.13 Wear the mask when sterile instruments intended for the procedure are exposed.

4.3.3.14 The mask must always be worn in restricted areas, including the sub-sterile rooms and scrub sinks.

4.3.3.15 The mask will only be effective when it is properly worn,

4.3.3.15.1 Wear a surgical mask and safety eyewear to protect the mucous membranes of the eyes, nose, and mouth during procedures in which the possibility of splashes or sprays of blood, body fluids, and other secretions could occur.

4.3.3.15.2 The mask should be worn to cover the nose and mouth completely.

4.3.3.15.3 Some airborne diseases require unique masks like N95 or vented individual patient hoods.

4.3.3.15.4 Masks should fit comfortably but securely to prevent venting at the sides. Venting can allow the entry of infectious microbes that could contact the surgical team member's nose and mouth or the surgical team member's dispersal of contagious microbes to the sterile field.

4.3.3.15.5 The pliable metal or plastic noseband should be contoured to fit over the bridge of the nose to aid in providing a close fit and prevent the mask from slipping. Tape can cover this portion of the mask to prevent fogging of safety eyewear.

4.3.3.15.6 Masks should be either on or entirely off. They should not be allowed to hang around the neck or folded and placed in a pocket for later use. Masks harbour multiple microbes that can be transferred to the scrub suit and dispersed into the healthcare facility environment.

4.3.3.15.7 When a surgical team member is performing the surgical scrub, the mask must be worn and secured before starting the scrub. When other surgery department personnel who are not performing the scrub are talking with a person who is performing the scrub, the non-scrub person should wear a mask.

4.3.3.15.8 If wearing a mask with strings, the mask should be handled only by the strings when discarded to prevent contamination of the hands. When removing a mask, it should be immediately discarded into the biohazard waste bag. The surgical team member should perform a hand wash after removing the mask.

4.3.3.15.9 It is recommended that a new mask be used for each procedure or, at the minimum, changed frequently if it becomes wet and or/ contaminated by blood and body fluids

4.3.4 Proper Surgical Attire Recommendations:

4.3.4.1 Ensure the attire worn in each area of the procedure or surgical suite conforms to the recommended attire for that area. For example, the semi-restricted zone
requires surgical scrubs and a hat.

4.3.4.2 Wear facility-laundered (not home-laundered) and clean attire in semi-restricted
and restricted areas.

4.3.4.3 Wear long-sleeved, fully buttoned/snapped closed jackets or long-sleeved scrub
shirts in the restricted area. This guidance applies to all personnel in the surgical
environment, not only to perioperative nurses.

4.3.4.4 Ensure all personal clothing items, such as T-shirts, are entirely covered by scrub
attire.

4.3.4.5 Use a facility-approved disinfectant on personal items (briefcases, phones, etc.)
entering the surgical suite.

4.3.4.6 Masks should either be "on" or "off". Masks should be tied on the top and bottom,
with the nose and mouth completely covered. Masks should not be

"partially"
worn: dangling about the neck or from one ear.

4.3.4.7 Do not remove hats when leaving the surgical suite. For example, when going to
lunch.

4.3.4.8 Don't allow contaminated shoe covers or boots to leave the procedure or OR. Shoe covers or boots should be removed before leaving the procedure or OR.

4.3.4.9 Briefcases, backpacks, and other personal items that have been disinfected should not be placed on the floor. Personal items that can't be adequately surface disinfected should be placed in a plastic bag or contained in another manner. Note: The cap should cover all hair and the mask should cover the nose and mouth tightly.

4.3.5 Surgical Asepsis and the Principles of Sterile Technique:

4.3.5.1 Surgical asepsis is the absence of all microorganisms within any invasive
procedure.

4.3.5.2 The sterile technique is a set of specific practices and procedures to make
equipment and areas free from microorganisms and maintain that sterility.

4.3.5.3 Sterile technique is essential to help prevent SSI, an unintended and often
preventable complication arising from surgery.

4.3.5.4 These principles include the following:

4.3.5.4.1 Sterile (scrubbed) personnel are gowned and gloved.

4.3.5.4.2 Sterile personnel operates within a sterile field (sterile personnel touches only sterile items or areas; unsterile personnel touches only unsterile items or areas).

4.3.5.4.3 Sterile drapes are used to create a sterile field.

4.3.5.4.4 All items used in a sterile field must be sterile.

4.3.5.4.5 All items introduced onto a sterile field should be opened, dispensed, and transferred by methods that maintain sterility and integrity.

4.3.5.4.6 A sterile field should be maintained and monitored constantly.

4.3.5.4.7 Surgical staff should be trained to recognize when they have breached the aseptic technique and know how to fix the situation.

4.3.6 Maintaining Normal Body Temperature (Normothermia):

4.3.6.1 Hypothermia in surgical patients, defined as a core body temperature below 36°C, may result from general anesthesia and is common during and after major surgical procedures lasting more than two hours.

4.3.6.2 Intraoperative hypothermia was associated with a 13% increase in infections
compared to patients who were warmed to normothermia.

4.3.6.3 Some researchers emphasized that pain, nausea, and shivering are among the
most frequently reported adverse events following the cooling down of the body
temperature in the OR.

4.3.6.4 It is advised that patients may prefer being kept warm during the surgical procedure and would favor the intervention to reduce the risk of SSI in Colorectal

surgery.

4.3.6.5 Preoperative normothermia may be most beneficial; patients who received 30 minutes of preoperative warming had lower intraoperative hypothermia rates.

4.3.6.6 Patients who are hypothermic at the end of surgery may remain hypothermic for up to 5 hours. Although there is no standardized duration of postoperative warming, one study used 2 hours of postoperative warming and showed reduced rates of SSI.

4.3.6.7 In some exceptional cases in cardiac surgery, the patient should go for deep hypothermia at 24 to 18 Celsius in complete circulation arrest, cardiac anesthesia, and the cardiac perfusionist should ensure normothermia to 37 Celsius at the end of the procedure.

4.4 Postoperative Measures:

4.4.1 Incision Care:

4.4.1.1 The type of postoperative incision care is determined by whether the incision is closed primarily (i.e., the skin edges are re-approximated at the end of the operation), left open to be closed later, or left open to heal by secondary intention.

4.4.1.2 Dressings used on primarily closed surgical wounds (24 to 48 hours) should be sterile and applied with an aseptic technique.

4.4.1.3 Change dressing when wet and if the patient has signs and symptoms of infection.

4.4.1.4 Examine the wound and report any signs or symptoms of infection.

4.4.1.5 When a surgical incision is left open at the skin level for a few days before it is closed (delayed primary closure), a surgeon has determined that it is likely to be contaminated or that the patient's condition prevents primary closure, e.g.,(edema at the site).

4.4.1.6 When a surgical incision is left open to heal by the secondary intention, the incision is packed and covered with a sterile dressing.

4.4.1.7 Sterile gloves and equipment should be used, and a sterile technique should be applied when dressing on any surgical incision.

4.4.1.8 The healthcare facility should develop a policy and system for follow-up with patients and their families about the surgical site for any symptoms of infection and inflammation.

4.4.1.9 When planning surgery for obese patients, it is essential to reinforce wound closure and consider negative pressure wound therapy to prevent complications and stimulate antibacterial action to prevent wound infections.

4.4.2 Surgical Antibiotic Prophylaxis Prolongation:

4.4.2.1 Consider giving a single dose of antibiotic prophylaxis intravenously on

starting
anesthesia and discontinuing antibiotic prophylaxis within 24 hours after surgery.

4.5 Training on SSI Prevention Activities:

4.5.1 Infection Prevention Personnel: Infection preventionists should be specifically trained in methods of SSI surveillance, can prospectively apply the definitions for SSIs, and have the ability to provide feedback and education to healthcare Workers (HCWs).

4.5.2 Healthcare Workers (HCWs): A trained surgeon leader should regularly educate surgeons and perioperative personnel through continuing education activities directed at minimizing
perioperative SSI risk through implementing recommended process measures.

4.5.3 Patients and Families: Provide education for patients and patient's families about SSI and activities to reduce the risk associated with intrinsic patient-related SSI risk factors.

5. MATERIALS AND EQUIPMENT:

5.1 **Forms and Records:**

5.1.1 SURGICAL BUNDLE FORM

Materials and Equipment

5.2.1 N/A

6. RESPONSIBILITIES:

6.1 ALL HEALTH CARE WORKERs

7. APPENDICES:

7.1 MOH list of antibiotics for surgical prophylaxis and timed

8. REFERENCES:

8.1 General Directorate of Infection Prevention and Control (GDIPC). Guidelines for the Prevention of Surgical Site Infection (SSI) Feb 2024 V 1.0

9. APPROVALS:

	Name	Title	Signature	Date
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Reviewed by:	Ms. Awatif Hamoud Al Harbi	IPC Director		March 12, 2024
Reviewed by:	Mr. Sabah Turayhib Al Harbi	Nursing Director		March 14, 2024
Reviewed by:	Mr. Abdulellah Ayed Al Mutairi	QM & PS Director		March 17, 2024
Reviewed by:	Dr. Thamer Naguib	Medical Director		March 20, 2024
Approved by	Mr. Fahad Hazam Al Shammari	Hospital Director & IPC Committee Chairman		March 24, 2024

ATTACHMENT: MATERIALS AND EQUIPMENT

5.1 Forms and Records:

5.1.1 SURGICAL BUNDLE FORM

PATIENT'S INFORMATION				
Patient name:		MRN:		
Unit: Bed No.		Age: M/F:		
Admission date:		Admission diagnosis:		
Operative Procedure:		Date of Operative Procedure:		
BUNDLE ELEMENTS		**YES**	**NO**	***N/A**
1. Appropriate Use Prophylactic Antibiotics	*Selection:* *a. Per MOH Antibiotics for surgical prophylaxis)*			
	Timely administration: *a. 30 mins to 1 hour before incision* *b. Vancomycin and fluoroquinolones, within 2 hours prior to incision*			
	Timely discontinuation: *a. After incisional closure*			
2. Appropriate Hair Removal	*Do not remove hair unless needed.* *If needed, remove outside OR by clipping*			
3. Immediate post-operative control of blood glucose levels in all patients	*Maintain first 2 days post-operative glucose: 110 – 150mg/dl*			
4. Maintain normothermia during the perioperative period	*Temperature must be > 35.5 ^{0} C*			
5. Use appropriate antiseptic solution	*Most effective antiseptic combination: a. chlorhexidine –alcohol* *b. povidone-iodine-alcohol*			

ATTACHMENT APPENDICES:

7.1 MOH list of antibiotics for surgical prophylaxis and timed

ANTIBIOTICS SURGICAL PROPHYLAXIS

The use of antimicrobial agents for dirty procedure or established infection is classified as treatment of presumed infection, not prophylaxis. The treatment is excluded from this form.

*Consider adding a single dose of gentamicin 5 mg/kg IV if your hospital is facing gram negative bacterial surgical site infection according to local hospital antibiogram.

*For procedures lasting more than 4 hours, or for procedures with more than 1,500 mL blood loss, **repeat** dose of Cefazolin every 4 hours OR Clindamycin every 6 hours as an alternative agent (in case of allergy or preferred regimen not available)

Gastroduodenal Procedures involving entry into the lumen of gastrointestinal tract (bariatric, pancreaticoduodenectomy) Procedures without entry into gastrointestinal tract (antireflux, highly selective vagotomy) for high-risk patients Laparoscopic procedure: Elective, high risk Appendectomy for uncomplicated appendicitis Colorectal Biliary tract: open procedure Small intestine: Non-obstructed or obstructed	
Preferred regimen : ❒ **Cefazolin** 2 g (if weight ≥120 kg: 3 g) (children dose:30 mg/kg) IV single dose + For appendectomy, obstructed small intestinal and colorectal add **Metronidazole** 500 mg (children dose:15 mg/kg) IV single dose within 60 minutes prior to incision	**Alternative agents:** ❒ **Clindamycin** 900 mg (children dose: 10 mg/kg) IV within 60 minutes + **Ciprofloxacin** 400 mg IV (children dose: 10 mg/kg) single dose within 120 minutes prior to incision Obstructed small intestinal **Metronidazole** 500 mg (children dose:15 mg/kg) IV single dose within 60 minutes prior to incision + **Ciprofloxacin** 400 mg IV (children dose: 10 mg/kg) single dose within 120 minutes prior to incision
Cardiac: Screen patients for MRSA nasal carriage, if positive eradicate with nasal mupirocin & chlorhexidine body wash for 5 days. Coronary artery bypass, Cardiac device insertion procedures (e.g., pacemaker implantation and Ventricular assist devices **Thoracic** Noncardiac procedures, including lobectomy, pneumonectomy, lung resection, and thoracotomy Video-assisted thoracoscopic surgery	
Preferred regimen : ❒ **Cefazolin** 2 g (if weight ≥120 kg: 3 g) (children dose: 30 mg/kg) IV single dose within 60 minutes prior to incision	**Alternative agents:** ❒ **Clindamycin** 900 mg (children dose:10 mg/kg) IV single dose within 60 minutes prior to incision ❒ **Vancomycin** 15 mg/kg (max.2 g) (children dose: 15 mg/kg) IV single dose within 120 minutes prior to incision
Cesarean delivery Vaginal or abdominal hysterectomy/other obstetric procedure	
Preferred regimen : ❒ **Cefazolin** 2 g (if weight ≥120 kg: 3g) IV single dose within 60 minutes prior to incision	**Alternative agents:** ❒ **Clindamycin** 900 mg (children dose:10 mg/kg) IV single dose + **Gentamicin** 5 mg/kg (children dose: 2.5 mg/kg) single dose within 60 minutes prior to incision
Head/ neck	

❒ Clean cut procedures: none	
Clean with prosthesis: (excluding tympanostomy tubes) **Preferred regimen:** ❒ **Cefazolin** 2 g (if weight ≥120 kg: 3 g) (children dose: 30 mg/kg) IV single dose within 60 minutes prior to incision	Clean with prosthesis: (excludes tympanostomy tubes) **Alternative agents:** ❒ **Clindamycin** 900 mg (children dose:10 mg/kg) IV single dose within 60 minutes prior to incision
Clean – contaminated: (cancer or other procedure with exception of tonsillectomy and functional endoscopic sinus procedure) **Preferred regimen:** ❒ **Cefazolin** 2 g (if weight ≥120 kg: 3 g) (children dose: 30mg/kg) IV single dose + **Metronidazole** 500 mg (children dose:15 mg/kg) IV single dose within 60 minutes prior to incision.	Clean – contaminated: (cancer or other procedure with exception of tonsillectomy and functional endoscopic sinus procedure) **Alternative:** ❒ **Clindamycin** 900 mg (children dose:10mg/kg) IV single dose within 60 minutes prior to incision
Urology:	
Preferred regimen: Lower tract instrumentation with risk factors for infection (includes transrectal prostate biopsy) Clean without entry into urinary tract ❒ **Cefazolin** 2 g (if weight≥120 kg: 3 g) (children dose: 30 mg/kg) IV single dose within 60 minutes prior to incision Involving implanted prosthesis Clean with entry into urinary tract ❒ **Cefazolin** 2 g (if weight≥120 kg: 3 g) (children dose: 30 mg/kg) IV single dose within 60 minutes prior to incision ± **Gentamicin** 5 mg/kg (children dose: 2.5 mg/kg) single dose within 60 minutes prior to incision Clean-contaminated ❒ **Cefazolin** 2 g (if weight ≥120 kg: 3 g) (children dose:30 mg/kg) IV single dose + **Metronidazole** 500 mg (children dose:15 mg/kg) IV single dose within 60 minutes prior to incision	**Alternative agents:** Lower tract instrumentation with risk factors for infection (includes transrectal prostate biopsy) Clean with entry into urinary tract Clean-contaminated ❒ **Ciprofloxacin** 400mg (children dose:10mg/kg) IV single dose within 120 minutes prior to incision Clean without entry into urinary tract ❒ **Clindamycin** 900 mg (children dose:10 mg/kg) IV single dose within 60 minutes prior to incision ❒ **Vancomycin** 15 mg/kg (max.2 g) (children dose: 15 mg/kg) IV single dose within 120 minutes prior to incision Involving implanted prosthesis ❒ **Clindamycin** 900 mg (children dose:10 mg/kg) IV single dose ± **gentamicin** 5 mg/kg (children dose: 2.5 mg/kg) single dose within 60 minutes prior to incision
Neurosurgery: Elective craniotomy and cerebrospinal fluid-shunting Procedures Implantation of intrathecal pumps	
Preferred regimen: ❒ **Cefazolin** 2 g (if weight≥120 kg: 3 g) (children dose: 30 mg/kg) IV single dose within 60 minutes prior to incision	**Alternative agents:** ❒ **Clindamycin** 900 mg (children dose: 10 mg/kg) IV single dose within 60 minutes prior to incision **If MRSA colonization is present:** ❒ **Vancomycin** 15 mg/kg (max.2g) (children dose:15 mg/kg) IV single dose within 120 minutes prior to incision
Orthopedic: *Screen patients for MRSA nasal carriage, if positive eradicate with nasal mupirocin & chlorhexidine body wash for 5 days. *Clean operations: hand, knee or foot not involving implantation of foreign materials: none Spinal procedures with and without instrumentation Hip fracture repair Implantation of internal fixation devices (e.g., nails, screws, plates, wires) Total joint replacement	

Preferred regimen: ❒ **Cefazolin** 2 g (if weight ≥120 kg: 3 g) (children dose: 30 mg/kg) IV single dose within 60 minutes prior to incision	**Alternative agents:** ❒ **Clindamycin** 900 mg (children dose: 10 mg/kg) IV for single dose within 60 minutes prior to incision ❒ **Vancomycin** 15 mg/kg (max.2g) (children dose:15 mg/kg) IV single dose within 120 minutes prior to incision
Vascular Hernioplasty or herniorrhaphy MESH Placement	
Preferred regimen: ❒ **Cefazolin** 2 g (if weight ≥120 kg: 3 g) (children dose: 30 mg/kg) IV single dose within 60 minutes prior to incision	**Alternative:** ❒ **Clindamycin** 900 mg (children dose:10 mg/kg) IV for single dose within 60 minutes prior to incision ❒ **Vancomycin** 15 mg/kg (max.2g) (children dose:15 mg/kg) IV single dose within 120 minutes prior to incision
Plastic Clean procedure with risk factors or clean-contaminated	
Preferred regimen: ❒ **Cefazolin** 2 g (if weight ≥120 kg: 3 g) (children dose: 30 mg/kg) IV single dose within 60 minutes prior to incision	**Alternative:** ❒ **Clindamycin** 900 mg (children dose: 10 mg/kg) IV for single dose within 60 minutes prior to incision. ❒ **Vancomycin** 15 mg/kg (max.2g) (children dose:15mg/kg) IV single dose within 120 minutes prior to incision
Ophthalmic	
❒ **Topical Moxifloxacin** 1 drop every 5–15 minutes for 5 doses Addition of: (OPTIONAL) ❒ **Cefazolin** 100 mg by subconjunctival injection **OR** ❒ **Cefazolin** 1–2.5 mg Intracameral	
Liver transplantation	
Preferred regimen: **Piperacillin–tazobactam** 3.375 g (childern > 9 months and ≤ 40 kg: 100mg/kg of penicillin componant) IV single dose within 60 minutes prior to incision	**Alternative:** ❒ **Clindamycin** 900 mg (children dose: 10 mg/kg) IV for single dose within 60 minutes prior to incision + **Ciprofloxacin** 400 mg IV (children dose: 10 mg/kg) single dose within 120 minutes prior to incision ❒ **Vancomycin** 15 mg/kg (max.2g) (children dose:15mg/kg) IV single dose within 120 minutes prior to incision ++ **Ciprofloxacin** 400 mg IV (children dose: 10 mg/kg) single dose within 120 minutes prior to incision
Pancreas and pancreas–kidney transplantation	
Preferred regimen: ❒ **Cefazolin** 2 g (if weight ≥120 kg: 3 g) (children dose: 30 mg/kg) IV single dose within 60 minutes prior to incision	**Alternative:** ❒ **Clindamycin** 900 mg (children dose: 10 mg/kg) IV for single dose within 60 minutes prior to incision + **Ciprofloxacin** 400 mg IV (children dose: 10 mg/kg) single dose within 120 minutes prior to incision ❒ **Vancomycin** 15 mg/kg (max.2g) (children dose:15mg/kg) IV single dose within 120 minutes prior to incision ++

	Ciprofloxacin 400 mg IV (children dose: 10 mg/kg) single dose within 120 minutes prior to incision

*Post-operative duration of antimicrobial prophylaxis should be limited to less than 24 hours from surgery end time, regardless of the presence of indwelling catheters, drains or prosthesis .

- Classification of surgical wounds: ❒ clean ❒ clean- contaminated - Time of incision: _____ - Duration of surgery:_____ Hours. - Repeat dosing of antibiotic, if Yes: Drug Name: _____ Dose: _____ - Prophylaxis antibiotic duration: ❒ single dose ❒ Not more than 24 hours after surgery end time Comment:_____ MRP name: _____ Signature: _____	Time of antibiotics Administration:_____ Administration site: ❒ Peripheral ❒ Central Nurse name: Signature: Double check by (nurse name): Signature: Re-dosing administration nurse: Nurse comment: _____