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Anesthesiology

I. Description

Provides infection prevention guidelines for anesthesiology to reduce the risk of healthcare-associated infection

II. Rationale

Anesthesia personnel prepare and administer a variety of intravenous, regional and epidural medications to patients during times of impaired resistance to infection, as well as insert a variety of invasive monitoring devices. This policy provides guidelines to minimize the risk of healthcare-associated infection associated with anesthesia care.

III. Policy

A. Infection Prevention and Control Policies

Anesthesia personnel work in a variety of areas within the UNC Medical Center. Health care personnel (HCP) are required to follow the Infection Prevention Guidelines for Procedural Care Suites, Operating Room, and the Post Anesthesia Care Unit found in the [Infection Prevention Guidelines for Perioperative Services policy](#) and should be familiar with infection prevention policies for other clinical areas where they may work.

B. Personnel

1. HCP must adhere to guidelines found in the [Infection Prevention policy: Infection Control and Screening Program: Occupational Health Services](#).
2. HCP must adhere to the Infection Prevention policy: [Isolation Precautions Policy](#).
3. HCP must adhere to the Infection Prevention policies: [Exposure Control Plan for Bloodborne Pathogens](#) and the [Tuberculosis Control Plan](#).
4. HCP must adhere to all personnel guidelines in the [Infection Prevention policy: Infection Control Guidelines for Adult and Pediatric Inpatient Care](#)
5. Hand hygiene will be performed in accordance with the Infection Prevention policy: [Hand Hygiene and Use of Antiseptics for Skin Preparation](#).

6. HCP will wear personal protective equipment as needed when splash or splatter of blood or other potentially infectious materials is likely.
7. HCP will adhere to the UNC Surgical Services dress code (as described in the [Infection Prevention Guidelines for Perioperative Services](#) policy).
8. HCP will comply with aseptic technique protocols as stated in the [Infection Prevention Guidelines for Perioperative Services policy](#).
9. Infection control education, including OSHA-required education for bloodborne pathogens and TB, is completed annually via LMS. There will be a periodic review by members of Infection Prevention to assess compliance with established infection prevention policies and procedures.

C. Patients

1. Isolation Precautions: All policies and procedures for isolation precautions must be adhered to completely. Staff should be familiar with the Infection Prevention policies: [Isolation Precautions](#) and [Patients with Cystic Fibrosis](#).
 - a. All patients should be considered potentially infectious with a bloodborne pathogen. Standard Precautions must be followed as described in the Infection Prevention: [Isolation Precautions policy](#) and the Infection Prevention: [Exposure Control Plan for Bloodborne Pathogens](#) located in PolicyStat online.
 - b. Patients on isolation precautions will be managed as per the Infection Prevention: [Isolation Precautions policy](#) while in the Holding Area, Operating Room, Procedural Care Suites, and Post Anesthesia Care Unit. Anesthesia personnel will follow instructions for entering rooms of patients on isolation precautions.
 - c. Disposable items (e.g. rolls of tape) used for patients on contact precautions should either be discarded or returned to the room with the patient postoperatively.
 - d. For inpatients requiring isolation precautions, it is the responsibility of the patient care unit to communicate verbally the need for isolation prior to sending the patient to the Operating Room. The need for isolation should be noted. For patients who require Airborne Isolation, the patient care unit must call the OR at least 30 minutes prior to the start of the case in order for the OR to complete Airborne Isolation preparations.
 - e. Anesthesia personnel who obtain a patient history will note whether the patient is on isolation precautions and communicate this information to OR and PACU personnel.
 - f. Patients with an airborne or droplet transmitted disease and patients who are immunocompromised will wear a mask until in the procedure room or isolation room with staff appropriately masked. After procedure, the patient's mask should be replaced.
 - g. Patients with a known infectious pulmonary process (i.e. tuberculosis, chickenpox, MERS, SARS, etc.) will be managed using a disposable HEPA filter attached to the inspiratory and expiratory limb of the breathing circuit, just in front of the CO2 absorber.
 - h. If a HEPA filter was not used and a patient is found to have an infectious pulmonary process, refer to Infection Prevention: [Cleaning, Disinfection, and Sterilization of Patient Care Items policy](#) and the device manufacturer's instructions for use and cleaning of the ventilator assembly.

2. Safe Injection Practices: "One needle, one syringe, one patient, one time!"

a. Aseptic Technique:

- i. Use aseptic technique to avoid contamination of sterile injection equipment.

b. Syringes, needles, and cannula:

- i. Do not administer medications from a single syringe to multiple patients, even if the needle or cannula is changed.
- ii. Needles, cannula and syringes are sterile, single-use items. Do not reuse for another patient or to re-access a medication or solution

c. Single-Dose and Multi-dose Injectable Medication Vials:

- i. Refer to the policy [Medication Management: Use of Multi-dose Vials/Pens of Injectable Medications and Vaccines in Acute Care and Ambulatory Care Environments](#).
- ii. Multi-dose vials, once taken into a patient care room or area are then considered single dose vials and may not be used for other patients. The multi-dose vial must be discarded after use.
- iii. Store in accordance with the manufacturer's recommendations.
- iv. Discard if sterility is compromised or questioned.

d. Fluid infusion and administration sets (i.e. intravenous bags, tubing, and connectors):

- i. Use for one patient only and dispose appropriately after use.
- ii. Consider a syringe or needle/cannula contaminated once it has been used to enter or connect to a patient's intravenous infusion bag or administration set.
- iii. Do not use bags or bottles of intravenous solution as a common source of supply for multiple patients. Refer to the [Medication Management: Use of Multi-dose Vials/Pens of Injectable Medications and Vaccines in Acute Care and Ambulatory Care Environments](#) policy and Infection Prevention policy: [The Prevention of Intravascular Catheter-Related Infections](#).

3. Medication and Fluid Use:

a. Use appropriate aseptic technique and hand hygiene when preparing medications.

b. Use aseptic technique, including use of a sterile alcohol swab to cleanse the vial's rubber septum before entering the vial.

c. Cleanse the neck of glass ampules with a sterile alcohol swab and let dry before opening the ampule.

d. The following safety precautions are necessary:

- i. Use a sterile syringe and needle/cannula each time a medication or solution is accessed (One Needle, One Syringe, One Patient, One Time). The CDC specifically states, "Healthcare providers should never reuse a needle or syringe from one patient to another or to withdraw medicine from a vial." Syringes, needles and cannula are sterile single-use items and must not be reused to access any medication or solution.

- ii. Do not use a medication or solution for multiple patients in the "immediate patient treatment area." For practice of anesthesia, the CDC defines the "immediate patient treatment area" to include, at minimum, surgery/procedure rooms when anesthesia is administered and any anesthesia medication carts used in or for those rooms.
 - e. If a medication (or other solution) is not available in a single-dose vial and multi-dose vial must be used, discard the multi-dose vial after single patient use according to the policy [Medication Management: Use of Multi-dose Vials/Pens of Injectable Medications and Vaccines in Acute Care and Ambulatory Care Environments](#).
 - f. Needles should not be recapped routinely; however, in cases where recapping is necessary, use a one-handed technique to avoid needlesticks.
 - g. Discard all unused and/or opened medication/fluid containers (e.g., cap off, bag entered) no later than the end of the patient's anesthesia. Exception: bag/bottle in use with administration tubing connected to the patient's vascular access.
 - h. Open single-dose ampules must be immediately discarded and not be stored for any time period.
 - i. Discard used needles/syringes intact in a nearby sharps container as soon as possible after use. Safety devices must be deployed before discarding into sharps container.
 - j. Store clean and sterile syringes, needles, and related items in a designated clean area to avoid cross contamination from used and dirty items.
4. IV Administration Sets and Accessing: Refer to the Infection Prevention policy: [The Prevention of Intravascular Catheter-related Infections](#).
- a. Ports, stopcocks and needleless connectors will be prepped with alcohol for at least 5 seconds prior to each entry. Stopcocks must be managed with aseptic technique. A sterile needleless cap, syringe, or needleless connector must cover the port when not in use. When transferring the patient from the OR to the PACU/ICU, remove used syringes and cover ports with a sterile needleless cap, using aseptic technique. Alternatively, a needleless endcap may be placed on the stopcock ports.
 - b. Intravenous Set-Ups
 - i. Replace administration sets including secondary sets; add on devices and all needleless components every 96 hours. Label the IV tubing in an obvious location with the date the IV tubing is changed.
 - ii. PN - Change tubing used to administer lipid-free PN and glucose solution greater than 12.5% every 24 hours for adults and every 96 hours for pediatrics, and every 24 hours with lipid-containing solutions. When changing PN with lipids bag, the junction between the bag and spike on the administration set must be prepped with alcohol and allowed to dry before the spike is removed.
 - iii. Lipids - When lipids are administered as a separate infusion, change the administration set every 24 hours.
 - iv. Blood and blood product infusions: refer to the Nursing Policy: [Blood Product & Blood Derivative Transfusion Management](#).

- v. Suspected Infections – refer to the Infection Prevention policy: [The Prevention of Intravascular Cather-related Infections](#).
 - c. Skin Antisepsis for Intravenous and Arterial Catheters – refer to the Infection Prevention policy: [The Prevention of Intravascular Cather-related Infections](#).
- 5. Catheter Site Dressing Regimens – refer to the Infection Prevention policy: [The Prevention of Intravascular Cather-related Infections](#).
- 6. Propofol Administration
 - a. Propofol is a widely used anesthetic agent, which carries a high risk of contamination by infectious agents. Multiple clusters of postoperative fevers and infections have been reported in associated with the administration of contaminated propofol injection (MMWR 1990;39:426-7,433). Anesthesiology personnel must be familiar with and adhere to the Pharmacy's and manufacturer's recommendations for the administration of propofol.
 - b. Propofol will be prepared for use just prior to the initiation of each individual procedure.
 - i. The ampule neck or vial stopper will be disinfected using 70% isopropyl alcohol.
 - ii. The drug will be withdrawn into sterile syringes immediately after ampules or vials are opened.
 - iii. When withdrawing propofol from a vial, a sterile vent spike or an 18 gauge beveled blunt needle will be used.
 - iv. The syringes will be labeled with the provider's initials, medication name, medication concentration, date and time the ampule or vial was opened and will expire.
 - v. Administration should commence promptly and be completed within 6 hours after the ampule or vials have been opened.
 - vi. If propofol is administered directly from the vial, administration must be completed within 12 hours after the vial is spiked.
 - c. Propofol will be prepared for single patient use only. Any unused portions of propofol (e.g., vials, syringes, tubing) must be discarded at the end of the anesthetic procedure or at 6 hours (syringe) or 12 hours (vial), whichever occurs first.
 - d. Refer to the Infection Prevention policy: [The Prevention of Intravascular Cather-related Infections](#).
- 7. Protocol for Administration of First (Preoperative) Dose of Prophylactic Antibiotics to Prevent Surgical Site Infections
 - a. For outpatients and same-day admit patients who come through the Procedural Care Suites (PCS), if the surgeon has ordered prophylactic antibiotics, the nurse will obtain the antibiotic from Pharmacy.
 - b. If an IV is started in PCS, the nurse may set up an antibiotic infusion line and connect it to the IV. If an IV is not started, the nurse may send the antibiotic with the patient to the OR.
 - c. The anesthesia provider will determine the appropriate time to infuse the antibiotic in order for it to be initiated prior to, but not more than 60 minutes before incision (120 minutes for

Vancomycin). Patients who are undergoing limb surgery under tourniquet require special consideration since their prophylactic antibiotics must be completely delivered before the tourniquet is inflated.

- d. Vancomycin demands a slower infusion time because it can cause erythema and hypotension if delivered too rapidly. In the inpatient holding areas, the same approach will be used for prophylactic antibiotics.
 - e. For inpatients who are already receiving antibiotics, the antibiotic schedule will not be interrupted nor altered.
 - f. For prolonged surgery or if there is significant intraoperative blood loss, additional intraoperative antibiotic doses may be required. For further information, refer to guidelines by the UNC Antimicrobial Stewardship Program, which can be found on the Pharmacy website: [Antimicrobial Surgical Prophylaxis Guidelines](#).
8. Placement and care of indwelling epidural catheters – refer to the Infection Prevention policy: [Infection Control Guidelines for Adult and Pediatric Care](#).
- a. Infectious contraindications to epidural anesthesia include local infection at the proposed site of insertion and systemic infection in a patient who has not received adequate antibiotic therapy.
 - b. Placement of an indwelling epidural catheter is a sterile procedure. Aseptic technique must be strictly followed when placing the epidural catheter. Remove jewelry (e.g. rings and watches), wash hands. Wear a mask covering both the nose and mouth and change the mask between each case. A cap and sterile nitrile gloves must be worn. Eye protection should be worn as per the Infection Prevention policy: [Exposure Control Plan for Bloodborne Pathogens](#). Hair of the patient should be covered. A sterile drape is placed to provide a sterile field for catheter placement.
 - c. Skin preparation is accomplished using a 2% chlorhexidine-alcohol preparation (e.g., Chloraprep) or 10% povidone-iodine. If there is a contraindication to chlorhexidine or 10% povidone-iodine (e.g., allergy,), 70% alcohol, or 2% tincture of iodine may be used as alternatives. The antiseptic should be liberally applied and allowed to dry prior to catheter insertion. Allow povidone-iodine to remain on the skin for at least 2 minutes or longer if not yet dry before inserting the catheter. The antiseptic should not be removed with alcohol.
 - d. After insertion of the epidural catheter, the site will be covered with a sterile dressing. The catheter is taped up the back with paper tape. The catheter is routinely inspected for migration and infection.
 - e. Sterile technique must be maintained when injecting medications into epidural lines. Ports must be swabbed with alcohol and the alcohol allowed to dry prior to each entry into the port.
 - f. The hang time for epidural fluids is 48 hours.
 - g. Patients who have the epidural left in place for postoperative pain control are examined daily by the Anesthesiology Pain Team for evidence of infection (e.g., fever, redness, exudate, swelling, pain). The catheter will be immediately discontinued if there is any evidence of infection. For patients who require long-term pain control, a tunneled epidural catheter is recommended.

- h. Epidural catheters are discontinued by an anesthesiologist, allowing for examination of the puncture site for inflammation/infection, order of cultures if appropriate, and assessing the integrity of the catheter.
 - i. An epidural catheter that accidentally disconnects from the luer-lock adapter should be considered contaminated and the epidural should be removed. Exception: if the disconnect occurs under direct observation (while handling the catheter) the catheter may be prepped with povidone-iodine or 70% sterile alcohol, reconnected, and this noted in the patient's chart.
9. Regional Block
- Regional blocks are performed by anesthesiologists or nurse anesthetists in many locations throughout the hospitals (e.g., Operating Room, Block Room, Holding Area, Procedural Care Suites, Pain Clinic, Radiology, Cysto Clinic). Aseptic technique must be maintained while performing these blocks.
- a. Simple regional block (i.e., Bier blocks or local infiltration) requires aseptic technique and skin preparation as described above with intravenous catheter insertion.
 - b. More invasive blocks require skin preparation and catheter insertion as described above with indwelling epidural catheters. The regional block is performed using either disposable items or reprocessed sterile block trays.

D. Equipment

- 1. Sterilized manufacturer products
 - a. Sterilized products from the manufacturer should be removed from shipping cartons before being brought into the restricted zone.
 - b. Packages should be inspected for sterile integrity and expiration date.
 - c. Sterile disposable supplies opened but not used due to cancellation of a case can be used for the following case only if:
 - i. Cancelled case never entered the room and
 - ii. Sterile disposable supplies have not been left unattended
 - d. Sterile trays (e.g., cut down, spinal anesthesia) should be opened immediately prior to use. Once opened, the set-up must not be left unattended. After use, all needles/sharps will be discarded into the designated puncture-proof container attached to the anesthesia cart.
 - e. Single use supplies will be disposed of after use (e.g., anesthesia circuit reservoir bags, oxygen tubing, circuit hoses and airways).
- 2. Reusable items: All reusable items (critical, semi-critical and non-critical) must be cleaned and reprocessed according to the device manufacturer's instructions. All sterilization and high-level disinfection practices must be compliant with the Infection Prevention policy: [Infection Control Cleaning, Disinfection, and Sterilization of Patient Care Items](#).
 - a. Single use, disposable laryngoscope blades and handles are strongly preferred. When reusable blades are necessary, they will be wiped off to remove gross soil and sent to CPD with the case cart for reprocessing.

- b. All critical and semi-critical endoscopes must be cleaned and either sterilized or high-level disinfected according to the manufacturer's instructions for use and following the Infection Prevention policy: [Endoscope](#). All personnel who clean scopes via high-level disinfection (HLD) must attend a three-hour HLD workshop initially and then a yearly (at least every 365 days) HLD refresher class. Additionally, all HLD staff must complete competency initially and at least every 365 days thereafter. Details regarding the HLD workshop, class and competencies are in the Infection Prevention policies: [Endoscope](#) and [Cleaning, Disinfection, and Sterilization of Patient-Care items](#).
- c. Non-critical items (e.g., head straps, contaminated blood pressure cuffs, stethoscopes, blood transfusion pumps, EKG leads) which cannot be immersed and have no mucous membrane exposure can be disinfected by wiping with an EPA-approved disinfectant (e.g., Metriguard, Sani-Cloth). If items are used on patients on Enteric Precautions, wipe with a bleach wipe.
- d. All surfaces of the anesthesia machine, blood warmers, IV poles and any other contaminated surfaces must be cleaned daily and after each patient use with an EPA-registered disinfectant (i.e., Metriguard, or Super-Sani Cloth).
- e. All external surfaces of the anesthesia carts must be cleaned daily and after each patient use with an EPA-registered disinfectant (e.g., Sani Cloths, Metriguard). Drawers should be emptied and cleaned when visibly soiled and on a routine basis and as needed. Carts should be labeled or stored in such a way that it is clear when a cart is clean and ready for another case, or dirty and awaiting cleaning. Supplies should be checked for expiration date on a routine basis.
- f. Patients with a known infectious pulmonary process (i.e., tuberculosis) will be managed using a disposable anesthesia filter attached to the inspiratory and expiratory limb of the breathing circuit, just in front of the CO2 absorber. If it is found that the patient has an infectious pulmonary process and a filter has not been used, then both the CO2 absorber and ventilator bellows will be sterilized following the absorbers' and bellows' manufacturer sterilization instructions. Details on this process are in the [Perioperative Services: Anesthesia Delivery System Head policy](#).

IV. Implementation

It is the responsibility of the Chair of the Department of Anesthesiology or his/her designee to implement this policy.

V. References

American Associate of Nurse Anesthetists. Position Statement Number 2. 13 safe practices for needle and syringe use. Reaffirmed by AANA Board of Directors November 2012.

American Association of Nurse Anesthetists. Infection Control Guide for Certified Registered Nurse Anesthetists. February, 2015.

ASA Committee on Occupational Health Task Force on Infection Control of Operating Room Personnel. Recommendations for Infection Control Practice of Anesthesiology. (Third Edition) 1999.

Mayhall, C.G. (2012). Hospital epidemiology and infection control (4th ed.). Philadelphia. Wolters Kluwer/ Lippincott, Williams, & Wilkins.

Rutala WA, Weber DJ. Disinfection and sterilization in health care facilities: what clinicians need to know. Clin Infect Dis. 2004;39:702-709.

SHEA Expert Guidance: Infection prevention in the operating room anesthesia work area, Munoz-Price et al, ICHE, 2019, 40, 1-17

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VI. Related Policies

[Infection Prevention Guidelines for Perioperative Services policy](#)

[Infection Prevention policy: Infection Control and Screening Program: Occupational Health Services](#)

[Infection Prevention: Cleaning, Disinfection, and Sterilization of Patient Care Items policy](#)

[Infection Prevention: Endoscope policy](#)

[Infection Prevention: Exposure Control Plan for Bloodborne Pathogens policy](#)

[Infection Prevention: Hand Hygiene and Use of Antiseptics for Skin Preparation policy](#)

[Infection Prevention: Infection Control Guidelines for Adult and Pediatric Inpatient Care policy](#)

[Infection Prevention: Patients with Cystic Fibrosis policy](#)

[Infection Prevention: The Prevention of Intravascular Catheter-Related Infections policy](#)

[Infection Prevention: Tuberculosis Control Plan policy](#)

[Infection Prevention: Isolation Precautions policy](#)

[Medication Management: Use of Multi-does Vials/Pens of Injectable Medications and Vaccines in Acute Care and Ambulatory Care Environments](#)

[Nursing: Blood Product & Blood Derivative Transfusion Management policy](#)

[Perioperative Services: Anesthesia Delivery System Head policy](#)

Attachments:

Approval Signatures

Step Description	Approver	Date
Policy Stat Administrator	Patricia Ness: Clin Nurse Education Spec	12/2019
	Thomas Ivester: CMO/VP Medical Affairs	12/2019
	Emily Vavalle: Director, Epidemiology	10/2019
	Sherie Goldbach: Infection Prevention Registrar	10/2019

Applicability

UNC Medical Center