I. Description

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

Table of Contents

I. Description ....................................................................................................................................... 1
II. Rationale .......................................................................................................................................... 1
III. Policy ............................................................................................................................................... 1
   A. Infection Control Policies ............................................................................................................ 1
   B. Personnel ................................................................................................................................... 1
   C. Patients ...................................................................................................................................... 2
   D. Equipment .................................................................................................................................. 9
   E. Implementation ......................................................................................................................... 10
IV. References .................................................................................................................................... 10
V. Reviewed/Approved by .................................................................................................................. 11
VI. Original Policy Date and Revisions ................................................................................................ 11

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 Control Policies

Anesthesia personnel work in a variety of areas within the hospital complex (e.g., Intensive Care Units, Operating Room, Post Anesthesia Care Unit, Procedural Care Suites, Labor and Delivery, Cystoscopy, Magnetic Resonance Imaging (MRI), Radiation Oncology, Radiology, Pain Management Center, Pediatric Hematology-Oncology Clinic and Ambulatory Surgical Center). Personnel are required to follow the Infection Control Guidelines for Procedural Care Suites, Operating Room and the Post Anesthesia Care Unit found in the Perioperative Services Infection Control Policy and should be familiar with infection control policies for other clinical areas where they may work.

B. Personnel


Personnel must adhere to the Infection Control Policies: Exposure Control Plan for Bloodborne Pathogens IC0021 and the Tuberculosis Control Plan IC0060.

Personnel should adhere to all personnel guidelines in the Infection Control Policy: Infection Control Guidelines for Adult and Pediatric Inpatient Care IC0030.
Anesthesiology

Hand hygiene will be performed in accordance with the Infection Control Policy: Hand Hygiene and Use of Antiseptics for Skin Preparation IC 0024.

3. Personnel will wear personal protective equipment (e.g., protective eyewear, mask, gloves, gown) as needed when splash or splatter of blood or other potentially infectious materials is likely. For example, protective eyewear, mask and gloves should be worn while performing intubation.

4. Personnel will adhere to the UNC Surgical Services dress code (as described in the Infection Control Policy: Infection Control Guidelines for Perioperative Services IC0059). Personal items such as backpacks should not be taken into the OR.

5. Personnel will comply with aseptic technique protocols as stated in the Infection Control Policy: Perioperative Services Infection Control Policy IC0059. Drinking, eating, applying cosmetics or lip balm and handling contact lenses are prohibited in areas where there is potential for blood and other potentially infectious materials exposure.

6. 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 Hospital Epidemiology to assess compliance with established infection control policies and procedures.

C. Patients

1. Isolation Precautions (All policies and procedures for isolation precautions should be adhered to completely. Staff should be familiar with the Infection Control Policies: Isolation Precautions IC0031 and Patients with Cystic Fibrosis (IC0012).

   a. All patients should be considered to be potentially infectious with a bloodborne pathogen. Standard Precautions must be followed as described in the Infection Control Isolation Precautions Policy and the Exposure Control Plan for Bloodborne Pathogens located on the Intranet@Work. Sharps safety devices (e.g., safety IV catheters) will be used unless there is a medical contraindication.

   b. Patients on isolation precautions will be managed as per the Infection Control 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. Patients who are colonized or infected with multi-drug-resistant organisms (MDROs) (e.g., Oxacillin-resistant Staphylococcus aureus [ORSA], VRE, Burkholderia cepacia) are managed utilizing Contact Precautions.

   d. 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.

   e. For inpatients requiring isolation precautions, it is the responsibility of the patient care unit to verbally communicate 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.

   f. 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.

   g. 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.
h. Patients with a known infectious pulmonary process (i.e. tuberculosis, chickenpox, MERS, SARS, etc.) will be managed using a disposable HMEF attached to the expiratory limb of the breathing circuit, just in front of the CO2 absorber.

i. If a HMEF was not used and a patient is found to have an infectious pulmonary process, refer to Appendix 1 of this policy on instructions for cleaning and disinfection of the ventilator assembly.

2. Safe Injection Practices:

   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 or the syringe 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 Vials:
      i. Use single-dose vials for parenteral medications whenever possible rather than multi-dose vials in accordance with Administrative Policy 0104, “Medication Management: use of Multi-dose vials in acute and ambulatory care environments.”
      ii. Do not administer medication from single-dose vials or ampules to multiple patients or combine leftover contents for later use.

   d. Multi-Dose Vials:
      i. Refer to the Administrative Policy: Medication Management: use of Multi-Dose Vials in Acute Care and Ambulatory Care Environments.
      ii. If a multi-dose vial must be used both the needle or cannula and syringe used to access the multi-dose vial must be sterile.
      iii. Do not keep multi-dose vials for use on multiple patients in the immediate patient treatment area and:
           Store in accordance with the manufacturer’s recommendations
           Discard if sterility is compromised or questioned.

   e. Fluid infusion and administration sets (i.e. intravenous bags, tubing, and connectors):
      i. Use for 1 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 Administrative Policy: Medication Management: Use of Multi-Dose Vials in Acute Care and Ambulatory Care Environments and the Infection Control Policy: The Prevention of Intravascular Catheter-Related Infections.

3. Medication and Fluid Use:

   a. Follow Safe Injection Practices as outlined in section C2 above
   b. Use appropriate aseptic technique and hand hygiene.
c. All medications and fluids are single-patient use only (including single-dose vials, multi-dose vials, ampules, syringes, bottles and bags, and controlled substances).

d. Use aseptic technique, including use of an alcohol swab to cleanse the vial’s rubber septum before entering the vial.

e. Cleanse the neck of glass ampules with an alcohol swab and let dry before opening the ampule.

f. When any medication vial (or solution) is accessed, both the syringe AND the needle/cannula must be sterile.

g. A “double layer” of safety precautions is needed:

   i. (1) 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. (2) 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.

h. 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 Administrative policy 0104.

i. Syringes should be capped when not in use.

j. 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.

k. Open single-dose ampules must be immediately discarded and not be stored for any time period.

l. Discard used needles/syringes intact in a nearby sharps container after use or, at the latest, at the end of the patient’s anesthetic. Safety devices must be deployed before discarding into sharps container.

m. Store clean and sterile syringes, needles, and related items in a designated clean area to avoid cross contamination from used and dirty items.

n. Store medications and solutions in accordance with the manufacturer’s recommendations and discard if sterility is compromised.

4. IV Administration Sets and Accessing

a. All IV tubing, bags of fluid, stopcocks, and connectors are single-use and must be disposed of at the completion of one patient use.

b. IV tubing should not be allowed to lie on the floor which can lead to damage and contamination. Ports, stopcocks and needleless connectors will be prepped with alcohol for 15 seconds prior to each entry.

c. Stopcocks must be managed with aseptic technique. A sterile needleless cap or syringe 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.

d. Intravenous Set-Ups

i. Intravenous set-ups for weekend neurosurgery, trauma, heart, and vascular surgeries may be pre-assembled on Friday by the anesthesia technicians for emergency cases. If the IV solution is prepared in the Pharmacy (e.g., medication added), follow the expiration date indicated on the Pharmacy label affixed to the IV bag.

ii. A 96-hour expiration time applies to IV set-ups that are prepared in advance of use for a patient. The 96-hour expiration time begins when the IV bag is first spiked and it applies regardless of when the IV set-up is used. If not used within 96 hours, the entire set-up should be discarded.

iii. 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.

Exceptions to the 96 hour rule:

PN- Change tubing used to administer lipid-free PN and glucose solution greater than 12.5% every 24hrs 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.

Lipids-When lipids are administered as a separate infusion, change the administration set every 24 hours.

Propofol-Change tubing used for the administration of Propofol (lipid anesthetic) every 12 hours.

Blood Infusion duration of any blood product is not to exceed 4 hours. Dispose of all blood products and administration tubing unless you are certain all units will completely infuse in less than 4 hours. After 4 hours of use, the blood administration tubing filter becomes full of product debris and will decrease the flow rate and damage the red cells.

iv. Suspected Infections - Change the IV tubing whenever a catheter is removed due to a suspected catheter-related infection. It is not necessary to change the IV fluids at the time the tubing is changed unless the fluid bag has been hanging for 96 hours or contamination is suspected. The tubing/bag connection must be prepped with an alcohol swab for 15 seconds and allowed to dry prior to removing old tubing and spiking a new bag.

v. The IV system should remain a closed system. If tubing must be disconnected, use aseptic technique to prevent contamination. The catheter must be capped with a needless access port and the administration set tubing closed with a sterile plastic cap.

5. Skin Antisepsis for Intravenous and Arterial Catheters

a. Hand hygiene is performed before every procedure.

b. Disinfect patient’s clean skin with an appropriate antiseptic before intravenous and arterial catheter insertions and at the time of dressing change.

i. For peripheral IV catheters, 70% alcohol may be used.
ii. For central catheters and arterial catheters, use a 2% Chlorhexidine-alcohol preparation (e.g., Chloraprep). If there is a contraindication to Chlorhexidine (e.g., allergy), 70% alcohol, 10% povidone-iodine, 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.

6. Additional Guidelines for Central Venous and Arterial Catheters
   b. It is recommended that a central line checklist be utilized for Central Venous Catheter insertions.
   c. A cap, mask, sterile gown, gloves, and eye protection as required by OSHA must be worn for all catheter insertions.
   d. For central venous catheters a large, sterile, fenestrated, full body drape should be used. For peripheral arterial catheters, use a large, sterile, fenestrated drape.
   e. Patients and/or their family members must be advised regarding the risks and measures taken to prevent central venous catheter infections and the education documented.
   f. Needle-guided access using ultrasound technology, except in emergencies, should be used for insertion of central catheters whenever possible to reduce the risk of mechanical complications and infection. Transilluminators may also be used for catheter insertion.

7. Catheter Site Dressing Regimens
   a. All intravenous and arterial catheter sites are dressed using a sterile transparent dressing (e.g., Tegaderm, Sorbaview) or sterile gauze and an adhesive (e.g., tape). Use gauze over the insertion site when bleeding or oozing is present. The dressing, not the adhesive, should cover the site unless the adhesive is sterile. Do not apply antimicrobial ointment.
   b. For central catheters only, a CHG-impregnated patch (e.g., BioPatch) should be placed around the catheter unless contraindicated. Contraindications include allergy to product, umbilical catheters, infants less than 1000g, and catheters with excessive oozing that require gauze and adhesive dressing.
   c. The date of insertion should be recorded on the dressing and in the medical record.
   d. Remove IV site dressings and apply a new dressing whenever the dressing becomes damp, loosened, or soiled. Do not reinforce loose dressings by adding gauze or tape.
   e. When changing an IV dressing for a central catheter, use clean gloves to remove the old dressing, perform hand hygiene and don sterile gloves to apply the new dressing. A mask is worn for the dressing procedure.

8. 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 association 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 will be used.
   iv. The syringes will be labeled with the name, date and time the ampule or vial was opened.
   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.

9. Albuterol Administration

The Albuterol container may be used for multiple patients until empty or expired. The plastic connector used is discarded and the tip must be cleaned with alcohol after each patient use.

10. 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 will set up an antibiotic infusion line and connect it to the IV. If an IV is not started, the nurse will 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 anti-infectives committee which can be found on the anesthesia carts or on the Pharmacy website: Antimicrobial Surgical Prophylaxis Guidelines — Pharmacy Intranet @ Work.

11. Placement and care of indwelling epidural catheters

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 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, trimmed with sterile scissors several centimeters from the end, reconnected, and this noted in the patient’s chart.

12. 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). Sterile 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
   a. Laryngoscope blades and handles will be manually cleaned then blades will be wrapped in a tray and steam sterilized or high level disinfected (i.e. Steris IE or another automated endoscope reprocessor validate for this use) and the handle will be wrapped in a tray (without batteries) and steam sterilized. The blades and handles are packaged separately then placed in a bag (e.g., Ziplock) to prevent recontamination. McGill forceps, Jackson forceps, and tongue holders are manually cleaned followed by high level disinfection (i.e. Steris System IE or another automated endoscope reprocessor validated for this use). McGrath Video Laryngoscopes are sterilized via Sterrad sterilizer.
   b. All sterilization and high-level disinfection practices must be in compliance with the UNC Health Care Infection Control Cleaning, Disinfection, and Sterilization policy.
   c. Endoscopes must be cleaned and high-disinfected following the Endoscope Infection Control Policy. All personnel who clean scopes must pass a competency test initially and annually thereafter. Details regarding competency and competency forms are in the endoscope and cleaning, disinfection, and sterilization policies.
   d. Glidescope will be cleaned and disinfected per manufacturer’s recommendations. The cobalt video baton, video cables, monitor and cables will be wiped down using an EPA-registered disinfectant (e.g. 70% alcohol, Metriguard, Super-Sani cloth) after each use. The GVL Stat is a single use item and will be disposed of immediately after use. The GVL and the rigid stylets must be high level disinfected (i.e. Steris IE).
   e. Bag valve masks (BVMs) may be reused on a single patient if a series of treatments (e.g. ECT) is planned. The BVM should be cleaned with alcohol after each use, stored in a plastic bag labeled with the patient name and medical record number. The bags should be stored in a clean area or storage room. Any BVMs that are grossly contaminated will be disposed of immediately and not stored.
   f. 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 70% alcohol or an EPA-approved disinfectant (e.g., Metriguard, Sani-Cloth). If items are contaminated with blood or other
potentially infectious material (OPIM) or used on patients on Enteric Precautions, wipe with a 1:10 solution of bleach and water. Spray bottles containing bleach must be labeled with contents and expiration date 30 days after made. Metriguard or Sani-Cloths may also be used.

g. All resuscitation bags are single patient use items.

h. Cleaning and Sterilization of GMS Absorber/Ventilator Assembly (see Appendix 1).

i. 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). Secondary bottles of disinfectant must be appropriately labeled.

j. 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 (i.e. monthly)

k. Patients with a known infectious pulmonary process (i.e., tuberculosis) will be managed using a disposable anesthesia filter attached to the 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 Anesthesia Delivery System Head policy: ATS 0001.

l. For reuse of single-use devices, follow the Infection Control Policy: “Reuse of Single-Use Devices.”

E. Implementation

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

IV. References


V. Reviewed/Approved by
   Hospital Infection Control Committee

VI. Original Policy Date and Revisions