I. Description

Describes policies and practices followed in Vascular Interventional Radiology to reduce the risk of healthcare-associated infection.

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II. Rationale

Diagnostic and treatment procedures conducted in Vascular Interventional Radiology are often invasive and involve the use of percutaneous catheters and drains. Strict adherence to infection control practices is necessary to reduce the risk of healthcare-associated infection.

III. Policy

A. Definition of Areas

Vascular Interventional Radiology consists of procedure rooms, scrub and control areas, storage rooms, utility rooms, and staff work rooms. There is also the Patient Recovery Unit (PRU) where patients are prepped and recovered. The contiguous areas of Vascular Interventional Radiology include the hallway, clean and dirty utility rooms, physician’s reading room, physician workroom and examining room. The entire Vascular Interventional Radiology area also includes offices, and a conference room.

B. Vascular Interventional Radiology

1. Personnel
   a. Personnel should adhere to guidelines established by the Occupational Health Service (OHS) (see policy: “Infection Control and Screening Program – OHS”).
      i. Immunizations should be up-to-date. Documented immunity to rubella, mumps, pertussis, varicella, and measles is required.
      ii. Tuberculosis screening is required at the time of employment and skin testing is strongly recommended annually thereafter.
      iii. Tetanus immunization should be up to date. Influenza, tetanus/diphtheria, pertussis, varicella, and hepatitis B immunizations are available at the hospital’s expense to all employees through OHS.
iv. Personnel exposed to communicable disease, for example, meningococcal infection, hepatitis A, tuberculosis, should report the exposure to the supervisor soon as possible, fill out an incident form, and be seen in OHS so follow-up may be instituted if necessary.

v. Personnel exposed to rubella, measles, or varicella and who are not immune (immunity is provided by natural disease or vaccination), or who have questionable immunity, should report the exposure to the supervisor, fill out an incident report, and be seen in OHS for follow-up.

vi. All employees will receive Tdap (tetanus/diphtheria/pertussis) vaccine unless, the last Td was less than two years ago or is contraindicated.

vii. Personnel with communicable infections (e.g. URI with fever, diarrhea, conjunctivitis, open draining lesions, active herpes simplex, herpes zoster) should report to OHS for evaluation before reporting to work.

viii. When OHS is closed, employees with urgent work-related illness will be seen in the Emergency Department. Consultation with the Infection Preventionist on call may be helpful in determining appropriate referrals to the Emergency Department.

b. Drinking, eating and application of cosmetics or lip balm, and handling contact lenses are prohibited in areas where there is potential for contamination with blood or other potentially infectious material.

c. Hand hygiene should be performed with the approved antiseptic (chlorhexidine gluconate) before and after each patient contact. An alcohol-based hand rub (e.g., Purell) may be used if hands are not visibly soiled. The use of artificial nail applications is prohibited for personnel who perform direct patient care. Fingernails should be kept clean and well manicured. Nail polish, if used, must be intact. Refer to the Hand Hygiene Infection Control Policy.

d. Clothing should be clean.

e. Hair should be secured so as not to come into direct contact with patients or sterile fields.

f. Personnel should be familiar with the “Cleaning, Disinfection, and Sterilization Infection Control Policy.”

g. When performing or assisting with procedures in the procedure rooms, the VIR dress code and the VIR policies will be followed.

h. Infection control education that includes bloodborne pathogens and tuberculosis education is required annually via LMS.

i. The following Infection Control policies will be followed: Isolation Precautions, Exposure Control Plan for Bloodborne Pathogens, and Tuberculosis Control Plan. The Radiology procedure request screen on the Clinical Work Station has a section that identifies if the patient is on isolation precautions. This section must be completed before the patient will be seen.

j. Employees should report all needlestick/sharps, mucous membrane, and non-intact skin exposures from blood and other potentially infectious materials. Hospital employees should report the exposure to OHS by calling the Needlestick Hotline at 966-4480. University employees should report the exposure to University Employee Health Service at 966-9119. When the clinic is closed, the caller will be given a contact number.
2. Procedure Rooms

Access will be limited to the minimum number of persons needed to safely perform the procedure and on occasion, observers. The physician in charge of the procedure, the Technical Supervisor or the Clinical Nurse II is responsible for controlling the number of persons present by approving observers, consultants, etc. Observers are required to stand in the control room and must be properly attired. The main door to Vascular Interventional Radiology has a posted sign, which reads: “Authorized Personnel Only…Proper Attire Required” (see section 4.a. “Dress Code”).

a. Cleaning and Maintenance

i. **Daily:** All permanent equipment within the room, as well as all countertops and wall units are to be cleaned with an EPA approved germicidal disinfectant (e.g. MetriGuard) at least daily. Environmental Services personnel will ‘terminally clean’ and wet mop the floors, clean countertops and sinks with an EPA-approved germicidal disinfectant, and change trash bags daily.

ii. **Between cases:** Equipment positioned close to the patient and the radiographic table, are to be cleaned with an EPA-approved germicidal disinfectant after patient use. Floors are to be cleaned between each patient when visibly soiled. Trash will be pulled as needed.

iii. **Weekly:** Monitoring equipment will be wiped down with an EPA approved disinfectant detergent weekly or when visibly soiled.

iv. **Blood spills:** Blood spills are to be cleaned promptly with a 1:10 sodium hypochlorite (bleach) solution or an EPA-approved germicidal disinfectant.

v. **Computer keyboards:** Computers should be used with clean hands. Keyboards and mouse are to be cleaned on a routine basis (e.g., weekly), using a disinfectant wipe such as Sani-Cloths.

vi. **Lead aprons:** Lead aprons are to be cleaned with an EPA-approved germicidal disinfectant every two weeks and when visibly soiled.

b. Environment

i. **Air control:** The rooms will be maintained at positive pressure with respect to the corridors. Movement in and out of the procedure room should be kept to an absolute minimum. This will allow the airflow system with its positive pressure room design to keep bacterial entrance to a minimum. Doors are to remain closed at all times. Pressure differentials are monitored on a routine basis by the Maintenance Department.

ii. **Traffic pattern:** Vascular Interventional Radiology (VIR) is divided into 3 zones to orient personnel to aseptic protocols.

   - **Unrestricted Zone:** Defined as patient examining room, offices, conference room, reading room and physician workroom.
   - **Semi-Restricted Zone:** Defined as the procedure rooms (not in use), control rooms, utility rooms, scrub rooms, and connecting corridors. Signs will be posted at all entrances, stating dress code requirements.
   - **Restricted Zone:** Defined as each procedure room when a sterile procedure tray is set up or a procedure is in progress.
c. Laundry
   Soiled linens will be placed in a fluid-resistant linen bag. Full laundry bags will be placed in the soiled holding room for pick-up.

d. Waste Disposal
   Personnel should comply with the policy, “Guidelines for Disposal of Regulated Medical Waste.” Blood and other potentially infectious material greater than 20 ml. per unit vessel will be discarded by pouring contents into the hopper and discarding the resealed container in a regular trash bag. If a container cannot be emptied, it is placed in the regulated medical waste bin (red bag).
   i. All emptied blood product containers (bags and bottles) as well as administration tubing will be placed in a regular trash bag.
   ii. All needles and sharps will be disposed of in the sharps disposal container located in each procedure room.

3. Other Spaces in the Vascular Interventional Area
   a. Hallways, contiguous spaces and PRU will be cleaned daily by Environmental Services using a dry mopping technique. The floors will be washed, stripped of wax, and re-waxed as needed.
   b. Offices, conference rooms and other spaces will be cleaned in the routine hospital manner.

4. Procedure Teams
   These teams consist of professional personnel who carry out the procedure and the Vascular Interventional Radiology specialists assisting them. There are generally two physicians, one or two radiological technologists and one radiological nurse (or Critical Care nurse) involved in the performance of all procedures.
   a. Dress Code
      i. Unrestricted Zone: Street clothes are permitted.
      ii. Semi-Restricted Zone: All personnel entering the Semi-restricted Zone must dress in a freshly laundered green uniform. Street clothes or uniforms from other departments are not permitted. Hair is to be contained in a hat. Shoe covers are worn if exposure of the feet to blood or body fluids is reasonably anticipated. Hats and shoe covers are to be changed when they become wet or torn. Note: Disposable jumpsuits are provided for certain visitors (e.g., photographers, police guards, or others with short, purposeful visits).
      iii. Restricted Zone: In addition to Semi-Restricted Zone attire, a mask which fully covers the nose and mouth will be worn when entering the procedure room if a procedure is about to begin or is underway or if sterile instruments are exposed. Disposable masks will be used and should be changed between cases. An impervious sterile gown must be worn over scrub attire if performing a procedure. Lead aprons will be worn under gowns by all personnel involved with the procedure, when needed. If scrubbed, eye protection must be worn as specified in the Exposure Control Plan for Bloodborne Pathogens.
      iv. Exiting and Re-entry: When leaving the department above for public areas, personnel should change into street clothes. If not possible, department uniform will ideally be covered with a buttoned lab coat. Mask, hat, and shoe covers will be
removed upon leaving the department. Upon re-entering the Semi-Restricted and Restricted Zones, the dress code will be followed as described.

b. Surgical Hand Antisepsis: Personnel involved with the procedure should perform hand and arm antisepsis prior to entering the room. The purpose of hand and arm-antisepsis is: a) to rid the skin of gross dirt and transient microbes; b) to reduce resident microbes to near zero; c) to leave a residual activity on the skin so as to retard growth of microbes on the hands of those persons who will be functioning as a part of the sterile procedure team. Surgical hand antisepsis may be accomplished with a scrubless alcohol/CHG antiseptic (e.g. Avagard) or with an antimicrobial agent (e.g. CHG) and scrub brush. For detailed instruction on surgical hand antisepsis, refer to Appendix 5 of the Infection Control policy for Surgical Services.

c. Observers: All persons not included above in the procedure team will be considered observers. These will include consultants (e.g., physicians from other services), students, and others approved to watch procedures. Observers will be asked to wear jumpsuits and hats. Shoe covers are worn if exposure of the feet to bloodborne pathogens is reasonably anticipated. Observers should remain in the control area at all times. If, however, the observer(s) must enter the procedure room, they must perform hand hygiene and don a lead apron and mask.

C. Patient Management

1. Transportation
   
a. Outpatients are placed on stretchers that belong to PRU. The stretchers are covered with a clean sheet that is changed between patients. Stretchers are cleaned with an EPA-registered germicidal disinfectant weekly and when visibly soiled. Inpatients entering the VIR procedure room should be on a stretcher or bed provided by and the responsibility of Patient Transportation.

   b. All patients entering the VIR procedure room should be dressed in a clean hospital gown. Pediatric patients should have clean pajamas or diapers and clean t-shirts.

   c. A patient’s personal dress should not accompany the patient into the procedure room.

   d. All patients have their hair covered with a cap. Patients who are undergoing a central line insertion should wear a surgical mask for the procedure. For patients undergoing angiograms or aortagrams the patient does not need to wear a hat. If, however, the insertion site is near the head, the patient should wear a surgical mask. After draping, the mask may be removed if the patient is able to keep the head turned away from the site.

2. Skin Preparation and Drape

   Sites to be used will be identified by the physician in charge of the procedure. If hair removal is necessary, it will be removed by using hair clippers or depilatory agents. The site will then be cleansed with an appropriate antimicrobial agent (e.g., Chloraprep, 4% chlorhexidine gluconate, 70% alcohol, or povidone-iodine) three times and allowed to dry. A sterile drape sheet (incorporating a sterile drape and a drape sheet) will be used to isolate the site as well as to cover the patient. During draping, draping material should be compact, held higher than the OR bed, and draped from the surgical site to the periphery. Care should be taken to handle sterile drapes as little as possible, and once the sterile drape is positioned, it should be disturbed as little as possible. Draping material below the level of the table is not considered sterile.

3. Upon completion of the insertion of the indwelling vascular catheter or drain, the remaining povidone-iodine should be removed via sterile technique. Removal should take place by
using a sterile sponge with sterile water or alcohol, starting at the insertion site and wiping using concentric circles, from the inside to the outside. If CHG is used, it should not be removed from the skin. Central lines should then be dressed according to the Infection Control Policy: "Prevention of Intravascular Catheter-Related Infections."

D. Equipment

1. Instrument Control
   a. Disposable procedure trays are used. While setting up the procedure tray, the technologist will use sterile technique and must adhere to the sterile zone dress code. Once trays are set up for a procedure, they should be covered to prevent contamination of opened supplies. Upon completion of the case, all open, unwrapped supplies are to be discarded.
   b. While a case is in progress in the procedure room, the instrument table with open instruments should be considered "off limits" to unscrubbed individuals.
   c. Occasionally an electric teakettle is utilized to boil sterile water. The steam from the teakettle is used to modify the shape of certain catheters. To ensure sterility of the water vapor, the water must be boiled at a vigorous, rolling boil for 5 minutes prior to use. After each use, the kettle is emptied, rinsed out and dried. The external surface will be cleaned with MetriGuard and stored in an upside down position in a designated clean area.

2. Pressure Monitoring Flush System
   Sterile disposable transducers are utilized for pressure monitoring.
   a. The transducer cable must be disinfected between uses.
   b. Hand hygiene should be performed before handling the pressure monitor set.
   c. Set-up of the system should take place in a clean area, away from sinks and other possible contaminants.
   d. Retrograde back-up of blood should be prevented by frequently checking for leaks and loose connections and by maintaining a continuous adequate pressure within the flush system.

3. Catheters
   All of the catheters used in the procedure rooms are disposable. These catheters are shipped from the manufacturer and are considered sterile unless the package is damaged. They are used once and discarded. Catheters that have reached the manufacturer’s expiration date should be removed from stock.

4. IV Fluids
   New IV fluids and connectors will be opened for each case in the procedure room. The flush used for cases is supplied to the table in a closed tubing system. A new bottle of IV contrast is opened at the beginning of each case and is only used for one patient.

E. Other Procedures Performed in Interventional Rooms

1. On occasion, staff from departments other than Radiology, perform procedures in the procedure rooms (or participate in ongoing procedures).

2. Room cleaning, personnel attire, and patient management will be the same as required for all other procedures that are performed by Interventional Radiology staff.
F. Implementation and Monitoring

The responsibility for both the implementation and monitoring of this policy belongs to the Division Chiefs of Neuro and Vascular Radiology, Vascular Surgery, the Technical Supervisor, Clinical Nurse IV, Vascular and Radiology Nursing Director and Clinical Supervisors. All appropriate members of the VIR staff will be given copies of this policy and made familiar with its terms. A copy will be a part of the complete Radiology Policy Manual, several copies of which are available in the Department. New staff will be instructed in the method of compliance with this policy.

IV. Reviewed/Approved by

Hospital Infection Control Committee

V. Original Policy Date and Revisions