Policies and Procedures
for
Infusion Nursing
4th edition
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The *Policies and Procedures for Infusion Nursing* is intended to reflect current knowledge and practices of the clinical nursing specialty of infusion therapy. Because clinical practice continually evolves based on ongoing research, users should make an independent assessment of the appropriateness and applicability of a policy or procedure in any specific instance, and should also consider the applicable federal and state laws and regulations, as well as the standard of care in a particular jurisdiction, as these may take precedence. INS is not responsible for injury to persons or property, or other harm, arising from the use of the *Policies and Procedures*. 
Preface

The Infusion Nurses Society (INS) is recognized as the global authority in infusion therapy, dedicated to exceeding the public’s expectations of excellence by setting the standard for infusion care.

In an ever-changing and complex health care system, INS recognizes the need to provide resources supported by current research and best available evidence to guide clinical practice. Better patient outcomes result when there is consistency in practice among health care professionals, which the Policies and Procedures for Infusion Nursing offers. This publication is intended to be used by nurses who develop organizational policies for infusion therapy, as well as to guide and enhance safe, efficient infusion delivery and quality patient care.

This fourth edition of the Policies and Procedures complements INS’ indispensable publication, Infusion Nursing Standards of Practice (2011). Topics and terminology correspond to those in the Standards; together these resources provide a solid foundation for clinical applications of infusion therapies. In addition, a bibliography accompanies each policy and procedure as a resource for those nurses seeking more information on a particular procedure.

As the basis for professional nursing practice, infusion nurses are reminded that they must have knowledge of their scope of practice as defined in their states’ Nurse Practice Acts. With variations among health care organizations, nurses must follow their organization’s policies, procedures, and/or practice guidelines, while acting in conformity with federal, state, and regulatory agencies. INS recommends an annual review of each organization’s policies and procedures to ensure compliance with regulatory and nonregulatory bodies.

Due to the invasive nature and risks associated with infusion therapy, nurses must have a basic understanding of the specialty and the principles that are implied for safe practice. The nurse must observe Standard Precautions and use aseptic technique when performing most infusion-related tasks or procedures. While the policies and procedures are general in nature, there may be device-specific features or specifications that need to be followed for proper function. The nurse should be familiar with the manufacturers’ directions for use so that the product/equipment is used properly and in the intended manner.

Most of the topics addressed fit in the typical policies and procedures format with the policy defining a course and purpose of an action to be taken, followed by the procedure as detailed step-by-step. The chapter on infusion-related complications does not fit the style, so in place of procedures, the areas of prevention, assessment, and intervention are described.

Finally, I would like to thank Lisa Gorski, MS, HHCNS-BC, CRNI®, FAAN, for her thoughtful review and contributions to this edition. Lisa gave generously of her time and was wholeheartedly committed to this important project. INS is grateful for her efforts.

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1. Patient Care

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Orders for the Initiation and Management of Infusion Therapy

Policy
Orders are clear, concise, legible, and complete prior to initiating, changing, or discontinuing infusion therapy.

The use of standing orders or order sets is established by the organization.

Verbal or telephone orders are to be signed within a time frame established by the organization.

Procedure
1. Obtain and review licensed independent practitioner’s (LIP’s) order for:
   - Patient name
   - Solution type or medication to be administered
   - Medication dose
   - Volume to be infused
   - Administration route
   - Infusion rate
   - Frequency of administration
   - Special considerations, if applicable

2. Contact LIP for clarification if the order is not complete or legible.

3. Determine appropriateness of the order, using the nursing process.

4. Use only those abbreviations that are standard for the organization.

5. Limit use of verbal or telephone orders from LIPs to only when medically necessary.

6. Always “read-back” a verbal or telephone order to verify order.
Bibliography


Patient Assessment

Policy
Patient assessment is performed to establish a baseline for monitoring reactions and response to therapy.

Assessment findings that impact the delivery of care will be reported to appropriate members of the health care team in a timely manner.

Procedure
1. Obtain and review licensed independent practitioner’s (LIP’s) orders for infusion therapy.
2. Review the patient’s permanent medical record for:
   • Age
   • Allergies
   • Clinical diagnosis, primary and secondary
   • History of chronic kidney disease
   • History of breast cancer and treatment
   • Complications or conditions that may affect therapy
   • Previous or current infusion therapy, including transfusion history
   • Medications, including over-the-counter and herbal preparations
3. Review pertinent laboratory and imaging studies.
4. Verify patient’s identity using 2 independent identifiers, not including the patient’s room number or bed number.
5. Inform patient of the assessment process.
6. Place patient in a comfortable position and provide privacy during the assessment.
7. Perform physical assessment.
   • Vital signs
     ° Temperature, pulse, respiration
     ° Blood pressure
   • Body weight
   • Height
   • Fluid volume status
     ° Intake and output
     ° Skin turgor
     ° Tongue turgor
     ° Moisture in oral cavity
     ° Thirst
° Tearing and salivation
° Appearance of skin
° Facial appearance
° Edema
° Neck veins
• Body systems as appropriate for the therapy
• Vascular assessment (see Site Assessment and Selection)
° Patient age, condition, and diagnosis
° Condition, size, and location of vessel
° Type and duration of therapy

• Patient’s ability to comprehend and understand therapy
• Patient’s ability to maintain therapy
• Patient’s perception of pain


10. Reassess patient at a frequency established by the organization or as patient status, needs, or therapy indicate.

Bibliography

Patient Education

Policy
The patient is provided with information about the prescribed infusion therapy, the plan of care, and expected or anticipated outcome(s) of therapy.

Patient education incorporates teaching methods based upon an assessment of age, developmental and cognitive level, cultural influences, and language preference; takes into account factors such as current stressors, sensory deficits, and functional limitations that may affect the ability to learn.

Procedure
1. Obtain and review licensed independent practitioner’s (LIP’s) order.
2. Provide easy-to-understand verbal explanations and written educational materials.
   - Use pictures, diagrams, and/or audio/video instructional aids at the level that the patient can understand
   - Avoid use of medical jargon and abbreviations
   - Use simple terminology
3. Teach patient about the following infusion-related topics; involve caregivers in the teaching as appropriate:
   - Proper care of the access device and any activity limitations
   - Administration of infusion therapy as appropriate (eg, home care/outpatients)
   - Precautions for preventing infection and other complications, including aseptic technique and hand hygiene
   - Signs and symptoms of complications to report
   - How/where/to whom signs and symptoms of complications are to be reported
   - Proper use, care, storage, and disposal of all products and equipment as appropriate (eg, home care/outpatients)
4. Evaluate patient’s level of understanding, reteaching, and clarifying information as needed and being attentive to questions and concerns.
   - Use methods such as asking the patient to restate key teaching concepts or “teach-back”
   - Have patient or caregiver provide return demonstrations of psychomotor skills as appropriate (eg, catheter flushing)
5. Document in the patient’s permanent medical record:
   - Patient’s knowledge deficit(s) and readiness to learn
   - Learning objectives
   - Implementation of the teaching plan
   - Demonstrated skills
   - Patient response to teaching
   - Evaluation of the overall process, actions, and results of patient education

**Bibliography**


Informed Consent

Policy
Informed consent will be obtained by the health care provider who will perform the infusion procedure after discussion that includes details of the procedure, risks and benefits, alternatives, and potential complications associated with the treatment or therapy. The nurse’s role, if not performing the procedure, is to verify that the consent was obtained.

The patient or caregiver has the right to refuse treatment. In the event that a patient is deemed incompetent or unable to give consent, the consent of a legally authorized representative will be obtained.

Informed consent includes documents at or below the 5th-grade reading level and in the primary language of the patient, and provision of a qualified medical interpreter or reader for patients with limited language proficiency, limited health literacy, and/or visual or hearing impairment.

Procedure

1. Obtain and review licensed independent practitioner’s (LIP’s) order.
2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.
3. Obtain consent form as appropriate.
   • Not all procedures require written informed consent forms
4. Provide patient with sufficient information regarding the ordered therapy in a culturally and linguistically appropriate format, and at an education level understood by the patient.
5. Allow opportunity for dialogue between the patient and nurse regarding the information provided.
   • The patient should be able to explain in everyday words the diagnosis or health problem; the name, type, and general nature of the treatment, service, or procedure; and the primary risks, benefits, and alternatives
   • If the nurse determines the patient still has questions, the health care provider who will perform the procedure should be notified
6. Obtain patient’s or legally authorized representative’s signature on consent form.
7. Place signed and dated consent form, as appropriate, in the patient’s permanent medical record.
Bibliography


Plan of Care

Policy

A plan of care (POC) is established, evaluated, and revised as necessary for each patient receiving infusion therapy in collaboration with the patient and family/caregiver, and the health care team.

Care planning is a collaborative, multidisciplinary process that includes the patient, family, or caregiver and the health care team. The plan of care is a patient-individualized, dynamic tool that changes as patient problems and progress toward expected outcomes are evaluated.

The plan of care, at a minimum, should include assessment, diagnoses, interventions, and outcome criteria.

Procedure

1. Obtain and review licensed independent practitioner’s (LIP’s) order for infusion therapy.

2. Develop a POC using the information obtained from the patient assessment:
   - Determine nursing diagnoses
   - Develop outcome criteria in relation to the patient’s capabilities, availability, and accessibility to resources, and include a time frame for achievement
   - Develop achievable nursing interventions consistent with the established plan of care, based on best evidence
   - Conduct an ongoing evaluation of the POC, revising diagnoses, interventions, and expected outcomes as needed


Bibliography


Discharge Planning

Policy
The discharge planning process is initiated when the patient begins infusion therapy and continues throughout the anticipated plan of care.

Discharge planning is the development of an individualized discharge plan for the patient prior to leaving one health care system and either entering another system or being discharged home.

Procedure
1. Obtain and review licensed independent practitioner’s (LIP’s) order and plan for continued infusion therapy.
2. Verify patient’s identity using 2 independent identifiers, not including the patient’s room number or bed number.
3. Begin discharge planning when the duration of therapy is determined; discuss with patient and family in a culturally and linguistically sensitive format.
4. Follow up on discussion with patient and family regarding discontinuation of therapy, postdischarge plans, and any follow-up care or services.
5. Coordinate with appropriate agencies any postdischarge services ordered by the LIP.
6. Communicate appropriate information to postdischarge organizations, including the infusion plan of care, status of the vascular access device, tolerance of the infusion therapy, patient education provided, and continuing teaching/care needs.
7. Complete a written report evaluating the course of therapy and summarizing the discharge instructions for the patient. Send a copy to the LIP and other members of the health care team as appropriate.
8. Document the discharge plans in the patient’s permanent medical record.
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Documentation

Policy
Documentation regarding the patient’s infusion therapy and vascular access will contain accurate, factual, and complete information in the patient’s permanent medical record.

Documentation is to be legible, timely, accessible to qualified personnel, and readily retrievable.

The forms, methods of documentation, storage, and retention requirements of the patient’s permanent medical record, with attention to the federal regulations of the Health Insurance Portability and Accountability Act (HIPAA), are determined by the organization.

Procedure
Documentation should include, but is not limited to, the following:

- **General**
  - Pertinent nursing diagnosis (problem)
  - Initial and ongoing assessment and appropriate vital signs
  - Patient’s response to device insertion and therapy, including symptoms, side effects, or complications
  - Laboratory test results as appropriate
- **Patient and/or caregiver education**
  - In relation to the vascular access device (VAD) and/or the infusion therapy
  - Evaluation of understanding
  - Barriers to patient education
- **VAD placement**
  - Site preparation, infection prevention, and safety precautions taken during VAD placement; completion of a standardized tool for documenting adherence to recommended practices
  - Type, length, and gauge/size of VAD inserted
  - For central vascular access devices (CVADs) and all long-term infusion devices, the manufacturer and lot number
  - Date and time of insertion, number and location of attempts, functionality of device
  - Local anesthetic, if used
  - Insertion methodology, including visualization and guidance technologies
  - Identification of the insertion site by anatomical descriptors, laterality, landmarks, or appropriately marked drawings
  - For midline (ML) and peripherally inserted central catheters (PICCs): external catheter length, baseline mid-upper extremity circumference, and effective length of catheter inserted
• Radiographic confirmation of the anatomic location of the catheter tip location for all CVADs prior to initial use

• VAD ongoing assessment and monitoring
  ° Condition of the site, dressing, type of catheter stabilization, dressing change, site care, patient report of discomfort, pain, any changes related to the site
  ° A standardized assessment, appropriate for patient populations, for phlebitis, infiltration, or extravasation, allowing for accurate and reliable assessment on initial identification and with each subsequent site assessment
  ° Daily assessment of the need for continuation of the VAD
  ° Radiographic confirmation of the anatomic location of the catheter tip location for all CVADs for any apparent dysfunction of the catheter
  ° Upon removal: condition of site, condition of the catheter and length, reason for device removal, nursing interventions during removal, dressing applied, patient response, date/time of removal
  ° If cultures obtained: source of culture (eg, site, device, or blood)

• Infusion therapy administration
  ° Type of therapy, drug, dose, rate, time, route, and method of administration
  ° When multiple VADs or catheter lumens are used, indication of what fluids and medications are being infused through each pathway

Bibliography


Competence and Competency Validation

Policy
The practice of infusion nursing requires proficiency validation of nursing knowledge, skill, and expertise.

The nurse is responsible for attaining knowledge and competency reflective of current infusion nursing practice.

Competence includes application of knowledge, critical thinking skills, decision-making abilities, and psychomotor skills.

Clinical competencies for the infusion nurse specialist will be based on the infusion nursing core curriculum:

- Technical and clinical applications
- Fluid and electrolyte balance
- Pharmacology
- Infection prevention
- Neonates and pediatrics
- Transfusion therapy
- Antineoplastic and biologic therapy
- Parenteral nutrition
- Quality improvement

Competency requires a commitment to lifelong learning, self-reflection, and professional ethics.

Procedure
1. Identify specific skills or tasks for competency validation for all nurses in the organization who provide infusion-related care based on clinical outcome data, data from Unusual Occurrence and Sentinel Event Reports, patient populations, and patient satisfaction data.

2. Incorporate competencies in relation to specific patient populations, including age-specific needs and cultural needs of ethnically diverse populations.

3. Use a variety of methods in validating competency such as:
   - Written tests
   - Clinical scenarios and assessment of critical thinking skills
   - Skills laboratories
   - Observation of skills in the clinical environment

4. Use well-designed forms or checklists to identify objective and measurement assessment of performance.
5. Evaluate infusion therapy clinical competencies at intervals established by the organization.

6. Maintain documentation validating clinical competencies in the employee’s record.

**Bibliography**


Unusual Occurrence and Sentinel Event Reporting

Policy
The nurse should report and document any unusual occurrences in practice, including events determined to have an impact or potential impact on patient care, and/or any practice felt to be outside the norm of acceptable patient care as established by the organization.

Organizations should have defined processes to investigate unusual occurrences or sentinel events to assess cause and improve safety.

Organizations should create a “just culture” environment encouraging reporting of events and focusing on implementing system actions to prevent adverse events.

Procedure
1. Document information about the occurrence using the proper organizational form and submit to the appropriate individual or department. Information should include:
   • Assessment of the patient’s condition before and after the occurrence
   • Interventions and other actions taken
   • Notification of the licensed independent practitioner (LIP) and/or other members of the health care team

2. Document the occurrence/event in the patient’s permanent medical record. Information must be factual, objective, and nonjudgmental.
   • Do not reference completion of an occurrence report in the patient’s permanent medical record

Bibliography


Product Evaluation, Integrity, and Defect Reporting

Policy
Evaluation of infusion-related products and devices should include input from a multidisciplinary group of direct and indirect end-users, including the infusion nurse.

Preventive maintenance of infusion equipment will be verified as established by the organization.

Lot numbers, serial numbers, manufacturer, and other information used for tracking potential product defects will be maintained by the organization.

When a defective product or device is identified, it is removed from patient use and reported to the appropriate department and/or agency or manufacturer.

Product defect reporting includes suspected and known intrinsic and extrinsic contamination; product damage; product tampering; improper, unclear, or confusing patient or user instructions or labeling; similar or confusing product names; packaging problems; and reliance on color coding.

Procedure
1. Evaluate infusion-related products and devices with consideration given to cost, safety, and effectiveness.
2. Evaluate products or devices according to the parameters designated by the product evaluation committee.
3. Complete and return product or device evaluation forms to the designated committee member(s).
4. Verify that preventive maintenance of infusion equipment has been performed.
5. Maintain overwraps or other identifying information (model number, lot number, serial number, expiration date) in the event of a defective product or device, and remove product or device from the clinical area.
6. Complete and submit documentation as established by the organization.
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Hand Hygiene

Policy
Hand hygiene is a routine infection prevention practice that decreases the potential risk of microbial contamination and cross-contamination.

Hand hygiene facilities with adequate running water, liquid soap or antiseptic solution dispensers, and single-use towels or hot-air drying equipment must be provided and accessible to all health care workers.

When provision for hand hygiene facilities is not feasible, the organization must provide antiseptic hand cleanser or alcohol-based hand rubs/gels, clean cloths, or paper towels.

Artificial nails are not to be worn when providing direct patient care.

Proper hand hygiene is to be taught to patients and/or caregivers involved in care of the patient.

Procedure
1. Perform hand hygiene:
   • Before and after touching a patient
   • Before handling an invasive device
   • Before moving from a contaminated body site to another site
   • Before putting on and after removing gloves
   • After contact with inanimate objects in the immediate vicinity of the patient

2. Use alcohol-based hand rubs/gels preferentially:
   a. Remove jewelry.
   b. Dispense approximately 5 mL of waterless product into cupped hands.
   c. Use friction over all surfaces of both hands and rub vigorously until dry, approximately 20-30 seconds.

3. Use liquid soap or antiseptic solutions with running water alternatively and when hands are visibly soiled:
   a. Remove jewelry.
   b. Dispense soap or antiseptic solution into cupped hands and use continuously running water.
   c. Thoroughly cleanse the palms and backs of both hands.
      ° Avoid splashing that may cause contamination of clothing and other skin surfaces
   d. Rinse hands thoroughly under running water.
   e. Use clean paper towel to dry hands. Never wave hands or blow on skin to dry.
   f. Turn off faucet using same paper towel.


**Bibliography**


Management of Sharps, Hazardous Materials, and Hazardous Waste

Policy
Organizations that handle hazardous drugs and generate, collect, and dispose of medical and regulated wastes, which may include, but not be limited to, biological and radioactive materials, and pharmaceutical agents, and solutions will:

• Follow state regulations regarding the definition, generation, handling, transportation, storage, treatment, and disposal of medical and regulated waste
• Have written procedures to ensure safe handling of medical and regulated waste
• Have a written list of hazardous drugs
• Educate employees in the safe handling of hazardous drugs, medical and regulated waste, and complete written documentation that such training occurred

The Occupational Safety and Health Administration (OSHA) defines medical and regulated waste as:

• Liquid or semiliquid blood or other potentially infectious materials
• Contaminated items that would release blood or other potentially infectious materials in a liquid or semiliquid state if compressed
• Items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling
• Contaminated sharps
• Pathologic and microbiologic wastes containing blood or other potentially infectious materials

Infusion-related supplies that may be considered medical waste after use are:

• Catheter and steel winged infusion sets
• Infusion-related administration sets
• Syringes
• Lancets
• Dressings
• Isolation materials
• Sutures
• Blades
• Solution containers
**Procedure**

**Designation**
1. Designate wastes that are considered infectious, medical, or regulated based on definitions from OSHA and federal, state, and regulatory agencies, as well as the health care organization.
2. Ensure that all health care workers (HCWs) are aware of these definitions.

**Handling**
1. Don gloves and other personal protective equipment (PPE) as appropriate before handling hazardous drugs or medical and regulated waste.
2. Sharps will not be:
   - Broken
   - Bent
   - Sheared
   - Recapped
   - Resheathed
3. Activate devices with built-in safety controls during use as appropriate, according to manufacturer’s directions for use. Note that with passive safety devices, mechanisms to prevent needlesticks are automatically activated during product use.

**Packaging**
1. Place medical or regulated waste in a properly identified container or by affixing a BIOHAZARD label to the external bag. Waste can include:
   - Blood and blood products
   - Unused specimens such as cultures, blood, and tissue
   - Sharps containers
   - Large collection systems for body fluids such as wound drainage systems, auto-transfusion systems, and suction canisters
2. If the outside of the bag or container becomes contaminated, place within a second bag.

**Collecting and Storing**
1. Transport properly packaged medical or regulated waste to the designated area for collection or storage.
2. Transport waste to the collection or storage area during a time and by a route that minimizes exposure of others to the waste; clean the transport vehicle thoroughly before returning it to service.
3. If transporting waste by motor vehicle (eg, in the home care setting), ensure that medical and regulated waste is properly contained and separated from clean equipment and supplies.
4. Collection or storage areas for medical and regulated waste are restricted to authorized personnel. Areas must be:
   • Properly contained (ie, separate from clean patient care and equipment areas)
   • Marked with signage: AUTHORIZED PERSONNEL ONLY and BIOHAZARD with a biohazard symbol

Disposal
1. In some organizations, an in-house incinerator is used to destroy medical and regulated waste; if the organization does not use an incinerator, a management company must remove waste.
2. Body fluids and waste are not considered hazardous and may be disposed of via the sanitary sewer (eg, the patient’s bathroom or toilet); however, do not use handwashing sinks for disposal of body fluids and wastes.
3. Place a sharps container that is puncture-resistant, leak-proof, tamper-proof, and labeled with the BIOHAZARD symbol in an easily accessible location for immediate use.
4. Dispose of all expended sharps in sharps container.
5. Consult the manufacturer’s directions for use in sealing sharps containers.
6. Dispose of the sealed sharps container as established by the organization.

Medical Waste Spills
1. Don gloves.
2. Immediately begin to clean the spill:
   • Use paper towels to wipe the initial spill, followed by use of the appropriate cleansing agent
   • If spill is on equipment, follow the manufacturer’s directions for use for cleaning
3. Properly dispose of contaminated supplies.
4. Remove gloves and perform hand hygiene.

Cytotoxic Agent Spills
1. When working with cytotoxic agents such as antineoplastic drugs, a spill kit will be available in patient care areas, in the pharmacy compounding area, and in the homes of patients receiving infused antineoplastic drugs.
2. HCWs will be trained in handling cytotoxic agents and use of spill kits.
For ALL exposures and spills
Follow the organization’s procedure for Unusual Occurrence Reporting and documentation.

For eye exposure:
• Immediately flush affected eye with copious amounts of water or eye rinse solution
• Obtain medical attention

For skin exposure:
• Remove contaminated clothing and gloves
• Wash skin with copious amounts of soap and water
• Obtain medical attention

For general spills:
• Restrict access to the spill area
• Don protective eyewear, double set of gloves, gown, and mask
• Absorb the liquid using spill kit
• Wash spills on inert surfaces with appropriate solution for the type of spill
• Place all contaminated material into a hazardous waste receptacle

For spills within the controlled air environment:
• If spill is 5 mL or less in volume, turn the hood blower off
• Don protective eyewear, double set of gloves, gown, and mask
• Wipe the spill area with sterile water, then with alcohol. Repeat 3 times
• If the hood’s high-efficiency particulate air (HEPA) filter is contaminated, filter must be replaced and hood recertified
  ° Do not use unit
  ° Place DO NOT USE - CONTAMINATED sign on unit

Bibliography


Durable Medical Equipment Disinfection

Policy
Durable medical equipment (DME) will be routinely cleansed with disinfectant that is effective in preventing cross-contamination.

DME removed from a home care setting should be cleaned and disinfected before transporting to an appropriate site for terminal cleaning and disinfection.

DME includes, but is not limited to, the following:
- IV poles
- Electronic infusion devices (EIDs)
- Ultrasound or infrared devices
- Other nondisposable equipment

Procedure
1. Don gloves prior to disinfecting equipment.
2. Label equipment requiring further disinfection as established by the organization.
3. Disinfect DME at intervals established by the organization and according to the manufacturer’s directions for use.
4. Use disinfecting solutions that provide protection against:
   - Bacteria (eg, TB)
   - Viruses (eg, HBV and HIV)
   - Other microorganisms as required by regulatory and accrediting agencies
5. Remove gloves and perform hand hygiene.

Bibliography


Standard Precautions

Policy
Standard Precautions are observed by all health care providers when providing patient care in all health care settings.

Standard Precautions are based on the assumption that every person is potentially infected or colonized with an organism that could be transmitted, and that all blood/body fluids, secretions, excretions (except sweat), nonintact skin, and mucous membranes may contain transmissible agents.

Standard Precautions include the following components:
- Hand hygiene (see Hand Hygiene)
- Use of personal protective equipment (PPE) to prevent contamination of skin and clothing when contact with blood and body fluids is possible
- Respiratory hygiene/cough etiquette
  - Strategy targeted at patients and caregivers with undiagnosed transmissible respiratory infections, including persons with cough, congestion, rhinorrhea, or increased respiratory secretions, and includes patient education
- Safe injection practices
- Use of a mask for insertion of central venous catheters or injection of medications into spinal or epidural spaces via lumbar puncture procedures (eg, spinal/epidural anesthesia)

Procedure
Use of Personal Protective Equipment: Gloves

1. Wear disposable gloves for direct patient care as follows:
   - When anticipating direct contact with blood or body fluids, mucous membranes, nonintact skin, and other potentially infectious material
   - When having direct contact with patients who are colonized or infected with multidrug–resistant organisms (MDROs) transmitted by the contact route
   - When cleaning the patient environment or medical equipment

2. Make sure that gloves fit and are appropriate for the task.

3. Put on gloves last when using other PPE.

4. Change gloves when moving from a contaminated body site (eg, wound) to another contaminated body site or to a clean body site.
5. Do not use the same pair of gloves for more than 1 patient.
6. Perform hand hygiene after glove removal.
7. Use sterile gloves for procedures requiring aseptic technique such as central vascular access device site care.

Use of Personal Protective Equipment: Gowns
1. Wear a gown to protect skin and prevent soiling or contamination of clothing during procedures when contact with blood, body fluids, or excretions is anticipated.
2. Wear a gown for direct patient contact if a patient has uncontained secretions or excretions.
3. Remove and discard gown before leaving the patient’s room/home.
4. Do not reuse gowns even for repeated contact with the same patient.

Use of Personal Protective Equipment: Mouth, Nose, Eye Protection
1. Use masks in combination with eye protection to protect from contact with respiratory secretions or sprays of blood or body fluids such as during invasive respiratory procedures (eg, tracheostomy tube change, suctioning) or wound irrigations.
2. Use a face shield that fully covers the front and sides of the face, masks with attached shields, or mask in combination with goggles during aerosol-generating procedures.
3. Use a disposable ventilation device when performing mouth-to-mouth resuscitation.

Respiratory Hygiene/Cough Etiquette
1. Teach patients and caregivers to:
   • Cover their mouths and noses when coughing or sneezing
   • Use and properly dispose of tissues
   • Perform hand hygiene after contact with secretions
   • Wear a mask if appropriate
2. Post signs with clear language providing instructions about respiratory hygiene.
3. Provide access to hand hygiene supplies.
4. Provide tissues and no-touch receptacles for disposal (eg, open, plastic-lined waste baskets).
5. Instruct in use of spatial separation, providing at least 3 feet of distance between noninfected and potentially infected persons to reduce risk of transmission.

6. Wear a mask when examining patient with signs and symptoms of a respiratory infection, and avoid direct contact with patients if ill with a respiratory infection.

**Safe Injection Practices**

1. Use aseptic technique with all sterile injection equipment.

2. Use a sterile, single-use disposable needle and syringe for each injection.

3. Use single-dose vials whenever possible.

4. Do not administer medications from multidose vials or ampoules to multiple patients, or combine leftover contents for later use.

5. Do not keep multidose vials in the patient treatment area.

6. Consider a syringe or needle/catheter contaminated once it has been used to enter or connect to a patient, a patient’s solution container, or administration set.

7. Do not use bags or bottles of IV solutions as a common source of supply for multiple patients.

**Special Lumbar Procedures**

- Don mask when injecting or infusing solutions and medications in the epidural, intrathecal, or intraventricular space

**Bibliography**


Transmission-Based Precautions

Policy
Transmission-based precautions are used when patients are suspected or known to be infected or colonized with infectious agents that cannot be controlled with Standard Precautions alone.

Transmission-based precautions include contact, droplet, and airborne precautions.

Contact precautions are implemented for conditions where microorganisms may be directly transferred from one person to another such as through blood contact or ungloved contact when a skin infection is present or may be indirectly transferred through a contaminated object or person, for example, with shared thermometers or shared toys.

Droplet precautions are implemented for conditions where respiratory droplets that contain infectious microorganisms travel from the respiratory tract of the infected person to susceptible mucosal surfaces of another person, generally over short distances. Examples of transmission include coughing, sneezing, talking, and suctioning.

Airborne precautions are implemented for conditions in which dissemination of airborne droplets or small particles in the respiratory tract contain infectious agents that remain infectious over time and distance (eg, tuberculosis, spores of Aspergillus sp., rubeola virus, varicella zoster virus). Use of special respiratory protection, such as a NIOSH-certified N95 respirator, is recommended for health care workers.

Guidelines for specific recommendations for use of transmission-based precautions should be reviewed by the organization’s infection preventionist(s).

Contact and Droplet Precautions

Procedure
1. Follow Standard Precautions at all times.
2. Place patient in a single-patient room whenever possible.
   • Consult with infection preventionist when single room is not possible
   • Place patient in an exam room/cubicle in ambulatory setting as soon as possible
   • Limit transport and movement of patients outside of room other than for medically necessary needs/tests
   • For patients on droplet precautions, instruct patient to wear a mask and follow respiratory hygiene/cough etiquette when leaving room (see Standard Precautions)
3. Use appropriate PPE.
   • Gloves for touching intact skin or surfaces or articles in close proximity to patient
   • Gowns when anticipating that clothing will have direct contact with the patient or articles in close proximity to patient
   • Mask when entering room for patient on droplet precautions

4. Use disposable noncritical patient care equipment (eg, BP cuffs) in hospitals, long-term care settings, residential settings.
   • Home care:
     ° Limit amount of nondisposable patient care equipment brought into the home of patients
     ° Consider use of disposable stethoscope/BP cuff kits, and leave equipment in home
     ° Teach patient/caregivers to clean environmental surfaces in close proximity to the patient (eg, end table, TV remote) and frequently touched surfaces such as door knobs

5. Remove PPE and discard, ensuring that clothing and skin do not touch contaminated surfaces before exiting room.

6. Consult with infection preventionist for any questions or concerns.

Airborne Precautions

Procedure
1. Follow Standard Precautions at all times.

2. Place patient in an airborne infection isolation room (AIIR).
   • If not available, consultation with infection preventionist is warranted to determine appropriate placement

3. Use PPE upon entering room or patient home.
   • Wear a fit-tested N95 respirator
   • Use additional PPE as required based upon patient care needs

4. Limit transport and movement of patients outside of room/home other than for medically necessary needs/tests
   • Instruct patient to wear a mask and follow respiratory hygiene/cough etiquette when leaving room (see Standard Precautions)

5. Remove PPE and discard, ensuring that clothing and skin do not touch contaminated surfaces before exiting room.

6. Consult with infection preventionist for any questions or concerns.
Bibliography


Bloodborne Pathogen Exposure Control Plan

Policy
Bloodborne Pathogen Exposure Control Plan (ECP) is designed to protect the health and safety of all health care workers (HCWs) who can be reasonably expected, as the result of performing their job duties, to be exposed to blood or potentially infectious materials and comply with the OSHA Standard 29 CFR 1910.1030, Bloodborne Pathogen Exposure Control.

The ECP is a key document to assist organizations in implementing and ensuring compliance with the standard, thereby protecting the HCW.

The ECP includes:
- Determination of HCW exposure
- Implementation of various methods of exposure control
- Standard Precautions
- Engineering and work practice controls
- Personal protective equipment
- Hepatitis B vaccination
- Postexposure evaluation and follow-up
- Communication of hazards and training to HCWs
- Record keeping
- Procedures for evaluating circumstances surrounding exposure incidents

The ECP will be reviewed and updated annually and be accessible to all HCWs.

Procedure
Health Care Worker Education
1. Based on job description, provide HCW education during orientation, prior to the HCW’s engaging in any exposure categories, and annually thereafter.

2. Include the following in training and education:
   - Exposure categories (see below)
   - Activities that involve or may involve exposure to blood, body fluids, or tissues
   - Protective measures to be followed
   - Factors for evaluating exposure risks

3. Document initial and annual training and education of HCW. Maintain in HCW’s record.
Exposure Determination List

HCW activities are placed into the following categories:

- **Category I:** Activities that involve direct contact with blood, body fluids, or tissues to which Standard Precautions apply. Protection shall be available and worn for all procedures or other job-related activities that involve a potential for mucous membrane exposure or skin contact with blood, body fluids, or tissues.

- **Category II:** Activities that involve no exposure to blood, body fluids, or tissues, but employment may require performing unplanned Category I activities. Protection shall be available, but only worn depending on task.

- **Category III:** Activities that involve no exposure to blood, body fluids, or tissues.

**Bibliography**


Latex Sensitivity or Allergy

Policy
Latex-free equipment must be available for health care workers (HCWs) and patients who may have or are known to have a latex sensitivity or allergy.

Powdered gloves made of natural rubber latex are not used as they are associated with the greatest risk of sensitization and subsequent allergic reactions in individuals.

Low-protein, powder-free latex gloves or gloves made of nonlatex materials should be used.

Labels on medical devices should be reviewed for presence of latex.

Procedure
Patient
1. Assess patient for a latex sensitivity or allergy, history of asthma, environmental allergens, medications, and food allergies.
   • Food allergies can create cross-reactions with latex including, but not limited to, avocados, mangoes, pears, bananas, citrus fruits, chestnuts, and other tropical foods
   • Exposure to latex may cause a hypersensitivity response either locally at the site of contact or systemically, resulting in breathing difficulty, chest tightness and pain, anxiety, palpitations, cutaneous erythema and urticaria, angioedema, shock, and death

2. Document existence of allergy in patient’s permanent medical record and post LATEX ALLERGY sign outside the patient’s room.
   • Notify members of the health care team of the allergy
   • Upon discharge, provide patient with appropriate information regarding the allergy

Health Care Worker
1. Notify immediate supervisor and employee health department about latex sensitivity or allergy.
   • HCW will be supplied with latex-free personal protective equipment


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Add-on Devices

Policy
When an integral in-line administration system is unavailable, add-on devices may be required to facilitate the delivery of the prescribed therapy. Limit use of these devices due to the risk of contamination from manipulation, accidental disconnection, or misconnection.

Add-on devices (eg, extension loop/sets, filters, manifold sets, blunt cannulas, needleless connectors, stopcocks) will be:
- Attached aseptically and changed in conjunction with the administration set
- Changed immediately upon suspected contamination or upon a break in integrity

Needleless connectors are changed if there is blood or debris visible within the needleless connector, upon contamination, prior to drawing a blood culture through a catheter, and routinely as established by the organization.

Procedure
1. Perform hand hygiene.
2. Don gloves.
3. Prime add-on device according to manufacturer’s directions for use (see Administration Set Change).
4. Remove existing add-on device.
5. Disinfect catheter hub/access port with antiseptic solution.
6. Attach new, sterile add-on device to catheter hub/access port.
7. Flush and lock catheter or initiate infusion, as appropriate.
8. Discard used supplies.
9. Remove gloves.
**Bibliography**


Filters

Policy
Filters are used to prevent the passage of undesirable substances into the vascular system. The specific type and size of filter used is determined by the infusate and may be an add-on device or an integral part of the administration set.

Filters are applied and changed, coinciding with the administration set change.

Blood and blood component filters are changed every 4 hours or coinciding with blood administration set changes.

A 0.2-micron filter that is bacteria- and particulate-retentive and air-eliminating is used with nonlipid-containing solutions that require filtration.

A 0.2-micron filter that is surfactant-free, particulate-retentive, and air-eliminating is used with intraspinal infusions.

A 1.2-micron filter that is particulate-retentive and air-eliminating is used with lipid infusions or 3-in-1 parenteral nutrition.

Small-volume infusions of 5 mL or less over 24 hours and IV push medications should not be administered through a 0.2-micron filter.

When using an electronic infusion device (EID), the pounds per square inch (psi) rating of a filter should exceed psi exerted by the EID.

Procedure

1. The reader is referred to Administration Set Change as add-on devices, including filters, are applied and changed in conjunction with the administration set.

2. Place add-on filters as close to the catheter insertion site as possible.

Additional Information: Blood Filters

1. Use special blood component filters such as leukocyte-reduction filters to prevent febrile nonhemolytic reactions.

2. Discard blood filter at conclusion of transfusion or when filter becomes clogged with component debris.

3. Blood and blood component filters are not interchangeable with other types of filters.

4. Filters are not required for albumin or immune globulin infusion unless otherwise specified by manufacturer.
5. Types of blood filters:
   - Standard blood filter: Used to eliminate storage debris from infusing blood components. Size: 170 to 260 microns
   - Microaggregate filter: Used to filter degenerating platelets, leukocytes, and fibrin strands that can develop in blood units stored for 5 or more days. Size: 20 to 40 microns
   - Leukocyte-reduction filter: Flatbed, multilayered filter design using polyester fibers to provide filtration network. Filters remove leukocytes from red blood cells and are capable of removing 99.9% of leukocytes present in red blood cells and platelet units. Leukocyte-reduction filters should not be used for the administration of whole blood or other plasma products

Bibliography


Blood and Fluid Warmers

Policy
The blood or fluid warmer is intended to aid in the prevention of hypothermia during administration of blood, blood components, and other prescribed parenteral solutions.

Blood or fluid warmers may be indicated as a measure to decrease the incidence of cardiac dysrhythmias and cardiac arrest associated with the administration of multiple units of cold blood, blood components, or solutions.

Microwave ovens or immersion in warm water are not acceptable blood or fluid warming techniques.

Blood warmers are not indicated for routine transfusion of blood or blood components.

Blood must not be warmed above 42°C or placed into the refrigerator after warming.

The blood or fluid warmer will have:
- Visible thermometer
- Audible alarm system

Procedure
1. Perform hand hygiene.
2. Don gloves.
3. Follow the manufacturer’s directions for use for preparation and insertion of administration set into warmer.
   - Blood and fluid warmer administration sets are dedicated to the specific equipment and are not interchangeable
4. Attach to patient’s vascular access device.
5. Begin infusion as prescribed.
6. Remove gloves and perform hand hygiene.
7. Discard used supplies.
8. Monitor patient throughout therapy.
Bibliography


Flow-Control Devices

Policy
Flow-control devices regulate the administration rate of parenteral solutions and medications. When selecting the most appropriate device, considerations include patient age and condition, prescribed therapy, and setting in which therapy is delivered.

Mechanical infusion control devices include elastomeric balloon and syringe piston mechanisms that regulate and control the administration rate of prescribed medications/solutions.

Electronic infusion devices (EIDs) are powered by an internal battery or electricity that controls the administration rate of prescribed medications/solutions.

Safety features of EIDs should include:
- Dose-error reduction systems
- Audible alarm
- Battery life and operation
- Anti–free-flow mechanism
- Accuracy of delivery
- Drug calculation
- In-line pressure monitoring
- Adjustable occlusion pressure levels
- Antitampering mechanism

Procedure
1. Perform hand hygiene.
2. Don gloves.
3. Assemble administration set.
   - Spike solution container
   - Prime set and any add-on devices according to the manufacturer’s directions for use
4. Connect administration set to vascular access device.
5. Turn on flow-control device and begin infusion.
6. Label administration set with date and time.
7. Remove gloves and perform hand hygiene.
**Home Care/Outpatient Setting**

1. Evaluate the ability of patient or caregiver to understand and use flow-control devices.

2. Instruct patient or caregiver on:
   - How to wear the flow-control device, if applicable
   - How to operate the flow-control device
   - How to care for the flow-control device
   - Alarms and actions to take
   - Whom to call for problems or questions


**Bibliography**


Tourniquets

Policy
A tourniquet is applied to promote venous distension in preparation for peripheral venipuncture.

Tourniquets should be single-use and latex-free.

Tourniquets should be loosely applied or their use avoided in patients who bruise easily, who are at risk for bleeding, who have compromised circulation, and/or who have fragile skin or veins.

A tourniquet is not to be applied on an extremity with an arteriovenous fistula.

Procedure
1. Perform hand hygiene.
2. Explain procedure to patient.
3. Apply tourniquet at an appropriate location above the intended insertion site.
   • If a BP cuff is used to promote venous distension, inflate to just below diastolic pressure
4. Ensure that arterial flow is not impeded.
   • An arterial pulse should be easily palpable distal to the tourniquet location
5. Remove tourniquet promptly at the conclusion of assessment or venipuncture procedure to prevent circulatory impairment.

Bibliography


5. **Vascular Access Device Site Selection and Placement**

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Vascular Access Device (VAD) Selection

Policy
The appropriate type of VAD (peripheral or central) is selected in collaboration with the nurse, the licensed independent practitioner (LIP), and the patient/caregiver based upon the following factors:

- Patient’s condition, age, and diagnosis
- Vein integrity, size, and location
- Type and duration of prescribed therapy
- Patient’s infusion history
- Patient’s preference for location, as appropriate
- Ability and resources to care for the device

A central vascular access device (CVAD) should be considered for anticipated infusion therapy if the medication or solution has a pH of less than 5 or greater than 9, osmolarity greater than 600mOsm/L, a final dextrose concentration above 10%, or for continuous vesicant therapy.

For patients with chronic kidney disease, consideration is made for preservation of peripheral veins for a potential arteriovenous fistula; the nurse should collaborate with the LIP in developing an appropriate plan for vascular access.

Procedure
1. Follow these guidelines when selecting a short peripheral catheter:
   - Infusion therapy duration is less than 7 days
   - The catheter can be maintained in the patient’s health care setting by health care provider or patient and/or caregiver
   - Use the smallest-size catheter to accommodate the prescribed therapy
     - 14- to 16-gauge catheters are recommended for trauma patients and those who require large volumes of fluid at a rapid rate
     - 18-gauge catheters are recommended for surgical patients and for rapid administration of blood (blood can be administered through smaller-gauge catheters, but the flow will be slower)
     - 20- to 24-gauge catheters are recommended for most medical-surgical patients
     - 22- to 24-gauge catheters are recommended for older adults
   - Limit use of steel winged devices to single-dose administration

2. Follow these guidelines when selecting a midline catheter:
   - Infusion therapy duration anticipated 1 to 4 weeks
   - Infusion therapies administered include hydration solutions, pain medications, and nonirritating antibiotics
• Infusates with pH less than 5 or greater than 9, or with an osmolarity greater than 600 mOsm/L, or a final dextrose concentration above 10%, should not be administered through a midline catheter
• The catheter can be maintained in the patient’s health care setting by health care provider or patient and/or caregiver
• Use the smallest-size catheter to accommodate the prescribed therapy.

3. Follow these guidelines when selecting a CVAD:
• Infusion therapy duration anticipated to be greater than 4 weeks
• Infusion therapies administered include short- or long-term continuous or intermittent solutions such as antineoplastic medications, vesicants or known irritants, parenteral nutrition, a variety of antibiotics, and infusates with a pH less than 5 or greater than 9 and osmolarity greater than 600 mOsm/L
• The catheter can be maintained in the patient’s health care setting by health care provider or patient and/or caregiver
• Use the smallest-size catheter to accommodate the prescribed therapy
• Anti-infective CVADs are considered for nontunneled CVADs in patients at high risk for catheter-associated bloodstream infection and/or in organizations that have a high rate of catheter-associated bloodstream infections despite other infection prevention strategies
• CVADs that can withstand high-pressure injections (eg, power-injectable infusion devices) are considered for patients who require ongoing imaging testing

Bibliography


Site Assessment and Selection

Policy
The vein selected for cannulation shall accommodate the size and length of the catheter.

Site selection is based upon the following factors:
- Patient’s condition, age, and diagnosis
- Vein integrity, size, and location
- Type and duration of prescribed therapy
- Patient’s infusion history
- Patient’s preference for location, as appropriate

Procedure
Patient Education and Assessment
1. Obtain and review licensed independent practitioner’s (LIP’s) order.
2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.
3. Provide patient with information on site assessment and selection, including vascular access device (VAD) benefits, management, and potential complications.
4. Obtain patient consent.
5. Place patient in recumbent position, as tolerated.
6. Assess patient.

Site Selection for Short Peripheral Catheter
1. Perform hand hygiene.
2. Explain procedure to patient.
3. Assess patient’s upper extremities.
   - Avoid using lower-extremity veins in adults
   - Initiate the site selection process in nondominant arm
   - Use vein visualization technologies as appropriate
4. Use the following principles to guide vein selection:
   - Assess appropriate veins on both dorsal and ventral surfaces including the metacarpal, cephalic, and basilic veins of the hand and forearm
   - Avoid the following:
     - Areas of flexion
     - Areas of pain upon palpation
Compromised veins (eg, bruised, phlebitic, infiltrated, sclerosed, corded)
Areas near valves
Areas where there are planned procedures
Extremity on the side of breast surgery with axillary node dissection, after radiation therapy to that side, presence of lymphedema; affected side after a stroke
For patients with chronic kidney disease, avoid forearm and upper arm veins

5. Assess veins by applying tourniquet (see Tourniquets).
   • Palpate extremity distal to tourniquet to assess vein condition and visually inspect skin integrity
   • Palpate intended venipuncture site to differentiate arteries from veins
   • If unable to palpate vein:
     ° Instruct patient to open and close fist several times
     ° Position extremity lower than the heart for several minutes
     ° Lightly stroke vein downward
     ° Apply heat to extremity for approximately 10-15 minutes to promote vein relaxation and dilation. Do not leave patient unattended during heat applications

6. Select the most distal site for short peripheral catheter placement.
   • Select sites that are proximal to any previous cannulation sites

7. Remove tourniquet.

8. Perform hand hygiene.

Site Selection for Midline Catheter and Peripherally Inserted Central Catheter (PICC)

1. Perform hand hygiene.
2. Explain procedure to patient.
3. Assess patient’s upper extremities.
   • Initiate the site selection process in nondominant arm
   • Use vein visualization technologies as appropriate
4. Use the following principles to guide vein selection:
   • Assess veins of upper extremity appropriate for midline catheter and PICC placement including the cephalic, basilic, median cubital, and brachial
   • Avoid the following:
     ° Areas of pain upon palpation
     ° Compromised veins (eg, bruised, phlebitic, infiltrated, sclerosed, corded)
° Areas where there are planned procedures
° Extremity on the side of breast surgery with axillary node dissection, after radiation therapy to that side, presence of lymphedema; affected side after a stroke
• Do not place a midline catheter or PICC in a patient with chronic kidney disease

5. Assess veins by applying tourniquet proximal to intended insertion site and use vein visualization technology as available.
• Palpate extremity distal to tourniquet to assess vein condition and visually inspect skin integrity
• Palpate the intended venipuncture site to differentiate arteries from veins
• If unable to palpate vein:
  ° instruct patient to open and close fist several times
  ° position extremity lower than the heart for several minutes
  ° lightly stroke vein downward
  ° apply heat to extremity for approximately 10-15 minutes to promote vein relaxation and dilation. Do not leave patient unattended during heat applications

6. Select catheter insertion site.
7. Remove tourniquet.
8. Perform hand hygiene.

Site Selection for Arterial Catheter Placement
1. Perform hand hygiene.
2. Explain procedure to patient.
3. Use the following principles to guide vein selection:
   • The radial artery is the most appropriate choice for cannulation
   • Alternative arteries include the ulnar, brachial, and dorsalis pedis
   • Perform Allen test
     ° Occlude the radial artery and compare the hand color to the other hand. Adequacy of collateral circulation through the ulnar artery is present if there is no change in color
     ° Occlude the ulnar artery and compare the hand color to the other hand. Adequacy of collateral circulation through the radial artery is present if there is no change in color. If there is a change in hand color, this is considered a negative Allen test. Radial artery access is contraindicated
   • Consult with LIP for a negative Allen test
5. Select catheter insertion site.

6. Perform hand hygiene.

**Bibliography**


Local Anesthesia

Policy
Consider the use of local anesthesia based upon nursing assessment of patient condition, needs, risks, and benefits to minimize the pain associated with vascular access cannulation or implanted port access.

The local anesthetic agent and method that is least invasive and carries the least risk for allergic reaction or infection will be selected.

Types of local anesthesia administered may include:
- Transdermal analgesic cream or patch
- Intradermal injection of lidocaine hydrochloride 1% solution
- Iontophoresis technology

Supplies
- Transdermal (topical) analgesic cream with following supplies:
  - Transparent semipermeable membrane (TSM) dressing
  - Gauze pads
  - Gloves, nonsterile
- Anesthetic dermal patch
- Lidocaine hydrochloride 1% solution with following supplies:
  - Antiseptic solution
  - Gauze pads
  - Gloves, nonsterile
  - 1-mL (tuberculin) syringe
- Iontophoresis equipment

Procedure
Note: Numbers 1-6 apply to all following phlebotomy procedures.

1. Obtain and review licensed independent practitioner’s (LIP’s) order.
2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.
3. Provide patient with information on the selected local anesthetic agent, including benefits, management, and potential complications.
4. Assess for any history of hypersensitivity to local anesthetics.
5. Perform hand hygiene.
6. Don gloves.
Use of Transdermal (Topical) Anesthetic Cream

7. Apply recommended amount of transdermal analgesic cream to intended venipuncture site or implanted port needle insertion site.
8. Cover analgesic cream with TSM dressing.
9. Remove dressing material after recommended application time; remove residual transdermal cream with gauze pad.
10. Proceed with site preparation and device insertion.
11. Assess for response and any reactions to topical anesthetic cream.

Use of Anesthetic Dermal Patch

7. Apply anesthetic dermal patch to intended venipuncture site or implanted port needle insertion site.
8. Leave on skin for the recommended application time.
9. Remove patch.
10. Proceed with site preparation and device insertion.
11. Assess for response and any reactions to anesthetic dermal patch.

Use of Intradermal Anesthetic

7. Cleanse skin of intended venipuncture site with antiseptic solution and allow to dry.
8. Draw 0.3 cc of injectable anesthetic into 1-mL (tuberculin) syringe.
9. With needle bevel up, gently insert needle intradermally above intended venipuncture site or implanted port needle insertion site.
10. Aspirate to confirm no blood return.
11. Inject 0.1 cc - 0.3 cc anesthetic to form wheal at intended access site.
12. Remove needle and discard syringe in appropriate sharps container.
13. Proceed with site preparation and device insertion.
Use of Iontophoresis

7. Refer to manufacturer’s directions for use.

8. Assess for response and any reactions to iontophoresis procedure:
   • Skin irritation or burns associated with use
   • Erythema under electrodes, which is usually transient


Bibliography


Short Peripheral Vascular Access Device Site Preparation and Placement

Policy
The short peripheral vascular access device (VAD) will be inserted using Standard Precautions and an aseptic, no-touch technique. With no-touch technique, the intended VAD insertion site is not palpated after skin cleansing, unless sterile gloves are worn.

No more than 2 attempts at short peripheral VAD placement will be made by any one nurse. Further attempts at peripheral VAD insertion should be made only if venous access is felt to be adequate.

Supplies
- Gloves, nonsterile
- Short peripheral catheter
- Vein visualization device, if applicable
- Single-use clippers or scissors for hair removal, if indicated
- Local anesthetic as indicated
- Stabilization device, sterile tape, or sterile surgical strips
- Needleless connector and any add-on devices
- Preservative-free 0.9% sodium chloride (USP) prefilled syringe(s) or primed administration set
- IV start kit (preferred) or the following:
  - Single-use tourniquet
  - Antiseptic solution
  - Transparent semipermeable membrane (TSM) dressing (preferred)
  - Sterile tape and sterile gauze for dressing
  - Label

Procedure
1. Obtain and review the licensed independent practitioner’s (LIP’s) order.
2. Verify the patient’s identity using 2 independent identifiers, not including the patient’s room number or bed number.
3. Provide the patient with information on the VAD insertion procedure including specific device benefits, management, and potential complications.
4. Obtain patient consent.
5. Place patient in recumbent position, as tolerated.
6. Perform hand hygiene.

7. Gather supplies.

8. Assess the upper extremities for an appropriate venipuncture site (see Site Assessment and Selection).

9. Prepare insertion site.
   - If visibly soiled, cleanse with antiseptic soap and water
   - Remove excess hair if necessary

10. Administer local anesthesia if indicated (see Local Anesthesia).

11. Perform hand hygiene.

12. Don gloves.

13. Cleanse insertion site with antiseptic solution; allow to dry completely.
   - Chlorhexidine solution (preferred): apply using a back-and-forth motion for at least 30 seconds
   - Povidone-iodine: apply using swabsticks in a concentric circle beginning at the catheter insertion site, then moving outward; it must remain on the skin for at least 2 minutes or longer to completely dry for adequate antisepsis

14. Apply a tourniquet above the intended venipuncture site and use vein visualization technology as available (see Tourniquets).

15. Stabilize the selected vein below the intended venipuncture site with the nondominant hand.

16. Insert the VAD according to manufacturer’s directions for use.

17. Release the tourniquet.

18. Attach needleless connector and any other appropriate add-on devices primed with preservative-free 0.9% sodium chloride (USP) and flush catheter, or attach primed administration set.
   - Observe the site for signs of swelling, or patient complains of discomfort or pain, removing VAD if present

19. Stabilize the VAD with sterile tape, surgical strips, or a stabilization device.

20. Apply a TSM dressing over the insertion site.
21. Discard used supplies in the appropriate receptacles.

22. Remove gloves and perform hand hygiene.

23. Label dressing:
   • Date and time of insertion
   • Gauge and length of VAD
   • Initials of inserter


Bibliography


Midline Catheter Site Preparation and Placement

Policy
Midline catheters are appropriate for therapies with pH above 5 and below 9, an osmolarity less than 600 mOsm/L, or a final dextrose concentration below 10%.

Midline catheters are not appropriate for the administration of contrast media, irritants, or continuous vesicant therapy.

No more than 2 attempts at midline catheter placement will be made by any one nurse.

The tip of the midline catheter does not extend beyond the axilla.

Supplies
- Personal protective equipment (PPE)
- Midline catheter insertion kit
- Antimicrobial solution for surface disinfection
- Ultrasound device, sterile wand cover, and sterile gel
- Disposable tape measure
- Single-use clippers or scissors for hair removal, if indicated
- Local anesthetic as indicated
- Stabilization device, sterile tape, or sterile surgical strips
- Needleless connector and/or add-on device
- Preservative-free 0.9% sodium chloride (USP) prefilled syringe(s)

Procedure
1. Obtain and review the licensed independent practitioner’s (LIP’s) order.
2. Verify the patient’s identity using 2 independent identifiers, not including the patient’s room number or bed number.
3. Provide the patient with information on the midline catheter insertion procedure, including device benefits, management, and potential complications.
4. Obtain patient consent.
5. Place patient in recumbent position, as tolerated.
6. Perform hand hygiene.
7. Gather supplies.
8. Close door to room and mark “Sterile Procedure in Progress - Do Not Enter.”
9. Assess upper extremities for contraindications to midline catheter placement (see Site Assessment and Selection).
   • Use of ultrasound is recommended for vasculature assessment.

10. Measure the distance from the intended insertion site to the desired terminal tip location.
    • The tip of the midline catheter does not extend beyond the level of the axilla.

11. Obtain measurements of the mid-forearm and mid-upper arm; include measurements in device insertion documentation.

12. Don mask and head covering.
    • Persons assisting with device insertion must wear full PPE.
    • Individuals remaining in the procedure area must wear a mask.

13. Perform hand hygiene.

14. Disinfect work area (ie, over-bed table) with antimicrobial solution; allow to dry completely.

15. Position patient with arm abducted.

16. Prepare insertion site.
    • If visibly soiled, cleanse with antiseptic soap and water.
    • Remove excess hair if necessary.

17. Assemble supplies on sterile field.

18. Perform hand hygiene.

19. Don sterile gown and gloves.

20. Prepare catheter according to manufacturer’s directions for use.

21. Flush catheter with preservative-free 0.9% sodium chloride (USP).

22. Place sterile drape under patient’s arm.

23. Cleanse insertion site with antiseptic solution; allow to dry completely.
    • Chlorhexidine solution (preferred): apply using a back-and-forth motion for at least 30 seconds.
    • Povidone-iodine: apply using swabsticks in a concentric circle beginning at the catheter insertion site, then moving outward; it must remain on the skin for at least 2 minutes or longer to completely dry for adequate antisepsis.
24. Prepare ultrasound probe according to manufacturer’s directions for use.

25. Apply a tourniquet above the intended venipuncture site or use alternative methods to promote venous distension (see Tourniquets).

26. Remove gloves and don new sterile gloves.

27. Cover patient head to toe with large sterile drape.

28. Administer local anesthetic at intended venipuncture site.

29. Apply sterile ultrasound gel.
   - Be sure no air is trapped between the ultrasound probe and the skin, which can obstruct vessel visualization

30. Locate vessel, as well as adjacent artery and nerve, using ultrasound.

Catheter Insertion Using the Modified Seldinger Technique (MST)

31. Perform venipuncture using device provided in insertion kit.

32. Observe venous blood return.

33. Firmly grasp the device with the thumb and forefinger.

34. Remove the stylet if using an over-the-needle device.

35. Insert the guidewire into the device, and carefully advance the guidewire.
   - The guidewire should not be advanced beyond the axilla
   - Do not advance the guidewire against resistance

36. Remove the catheter or needle down the guidewire.
   - Use caution so as not to dislodge or damage the guidewire

37. Remove the tourniquet.

38. Thread the dilator/introducer onto the guidewire, and advance it along the guidewire, through the skin and into the vessel.
   - To avoid guidewire embolism, maintain control and position of the guidewire at all times
   - If the dilator/introducer does not advance easily through the skin, use a scalpel to perform a small dermatotomy at the insertion site; to avoid potential damage to the vessel, the scalpel blade should be bevel-side up

39. Remove the guidewire and place on sterile field.

40. Verify the preinsertion measurement of desired catheter length.

41. Separate and remove the dilator from the introducer.
42. Slowly advance the catheter through the introducer to the premeasured length.

43. Verify blood return.

44. Flush catheter with preservative-free 0.9% sodium chloride (USP), observing for complications.

45. Peel the introducer away from the catheter.

46. Attach needleless connector.

47. Stabilize the catheter and apply sterile dressing.

48. Proceed with ordered therapy.

49. Dispose of used supplies in appropriate receptacles.

50. Remove and dispose of PPE and perform hand hygiene.

51. Label dressing:
   - Date and time of insertion
   - Gauge and length of catheter
   - Initials of inserter

52. Document procedure, including vessel accessed and length of catheter inserted, in patient’s permanent medical record.

**Bibliography**


Peripherally Inserted Central Catheter (PICC) Site Preparation and Placement

Policy
A PICC is appropriate for therapies with a pH below 5 and above 9, an osmolarity greater than 600 mOsm/L, a final dextrose concentration above 10%, parenteral nutrition, irritants, or continuous vesicant administration.

Power injection of contrast media will be performed only via a PICC that is approved for power injection.

No more than 2 attempts at PICC placement will be made by any one nurse.

The tip of the PICC terminates in the lower one-third of the superior vena cava to the junction of the superior vena cava and the right atrium.

PICC tip placement will be confirmed via chest radiograph prior to the initiation of therapy.

Supplies
- Personal protective equipment (PPE)
- PICC insertion kit
- Antimicrobial solution for surface disinfection
- Ultrasound device, sterile wand cover, and sterile gel
- Disposable tape measure
- Single-use clippers or scissors, if indicated
- Local anesthetic as indicated
- Stabilization device, sterile tape, or sterile surgical strips
- Needleless connector and/or add-on device
- Preservative-free 0.9% sodium chloride (USP) prefilled syringe(s)
- Heparin lock solution (10 unit/mL) prefilled syringe

Procedure
1. Obtain and review licensed independent practitioner’s (LIP’s) order.
2. Verify patient’s identity using 2 independent identifiers, not including the patient’s room number or bed number.
3. Provide patient with information on the PICC insertion procedure, including device benefits, management, and potential complications.
4. Obtain patient consent.
5. Place patient in recumbent position as tolerated.
6. Perform hand hygiene.
7. Gather supplies.

8. Assess upper extremities and chest for contraindications to PICC placement (see Site Assessment and Selection).
   • Use of ultrasound is recommended for assessment of the upper extremity and neck vasculature

9. Measure the distance from the intended insertion site to the desired terminal tip location.

10. Obtain measurements of the mid-forearm and mid-upper arm; include measurements in device insertion documentation.

11. Close door to room and mark “Sterile Procedure in Progress - Do Not Enter.”

12. Don mask and head covering.
   • Persons assisting with device insertion must wear full PPE
   • Individuals remaining in the procedure area must wear a mask

13. Perform hand hygiene.

14. Disinfect work area (ie, over-bed table) with antimicrobial solution, and allow to dry completely.

15. Position patient for procedure.
   • Semi-Fowler’s with arm abducted for upper extremity insertion
   • Trendelenburg for external jugular insertion

16. Prepare insertion site.
   • If visibly soiled, cleanse with antiseptic soap and water
   • Remove excess hair if needed

17. Assemble supplies on sterile field.

18. Perform hand hygiene.
   • A 3-minute scrub from fingertips to elbows is recommended for the insertion of a central vascular access device

19. Don sterile gown and gloves.

20. Prepare catheter according to manufacturer’s directions for use.

21. Flush catheter with preservative-free 0.9% sodium chloride (USP).

22. Place sterile drape under patient’s arm (shoulder for external jugular insertion).
23. Cleanse insertion site with approved antiseptic solution; allow to dry completely.
   - Chlorhexidine solution: apply using a back-and-forth motion for at least 30 seconds
   - Povidone-iodine: apply using swabsticks in a concentric circle beginning at the catheter insertion site, then moving outward; it must remain on the skin for at least 2 minutes or longer to dry completely for adequate antisepsis

24. Prepare ultrasound probe according to manufacturer’s directions for use.

25. Apply a tourniquet above the intended venipuncture site or use alternative methods to promote venous distention (see Tourniquets).

26. Remove gloves and don new sterile gloves.

27. Cover patient from head to toe with large sterile drape.

28. Administer local anesthetic at intended venipuncture site.

29. Apply sterile ultrasound gel.
   - Be sure no air is trapped between the ultrasound probe and the skin, which can obstruct vessel visualization

30. Locate vessel, as well as adjacent artery and nerve, using ultrasound.

**Catheter Insertion Using the Modified Seldinger Technique (MST)**

31. Perform venipuncture using device provided in insertion kit.

32. Observe venous blood return.

33. Firmly grasp the device with the thumb and forefinger.

34. Remove the stylet if using an over-the-needle device.

35. Insert the guidewire into the device, and carefully advance the guidewire.
   - The guidewire should not be advanced beyond the axilla
   - Do not advance the guidewire against resistance

36. Remove the catheter or needle down the guidewire.
   - Use caution so as not to dislodge or damage the guidewire

37. Remove the tourniquet.

38. Thread the dilator/introducer onto the guidewire, and advance it along the guidewire, through the skin and into the vessel.
   - To avoid guidewire embolism, maintain control and position of the guidewire at all times
• If the dilator/introducer does not advance easily through the skin, use a scalpel to perform a small dermatotomy at the insertion site; to avoid potential damage to the vessel, the scalpel blade should be bevel-side up

39. Remove the guidewire and place on sterile field.

40. Verify the preinsertion measurement of desired catheter length.

41. Separate and remove the dilator from the introducer.

42. Slowly advance the catheter through the introducer to the premeasured length.

43. Verify blood return.

44. Flush catheter with preservative-free 0.9% sodium chloride (USP), observing for complications.

45. Peel the introducer away from the catheter.

46. Attach needleless connector.

47. Stabilize the catheter and apply sterile dressing.

48. Lock catheter with heparin, as ordered.

49. Dispose of used supplies in appropriate receptacles.

50. Remove and dispose of PPE and perform hand hygiene.

51. Label dressing:
   • Date and time of insertion
   • Gauge and length of PICC
   • Initials of inserter

52. Obtain chest radiograph to verify PICC tip location prior to the initiation of ordered infusion therapy.

53. Document procedure, including the vessel accessed, the length of catheter inserted, and reported tip location, in patient's permanent medical record.
Bibliography


Vascular Access Device Stabilization

Policy
Vascular access device (VAD) stabilization is used to minimize catheter movement at the insertion site, which reduces the risk of complications, including catheter dislodgment and loss of access.

The use of stabilization devices is preferred over use of tape or sutures.

VADs will be stabilized using a method that does not interfere with assessment and monitoring of the access site or impede vascular circulation or delivery of the prescribed therapy.

Supplies
- Gloves, sterile
- Sterile stabilization device
  - Antiseptic solution
  - Skin preparation solution
  - Alcohol wipes, if needed
- Sterile tapes
- Sterile surgical strips

Procedure
Use of Stabilization Device

1. Perform hand hygiene.

2. Don gloves.

3. Apply the stabilization device according to manufacturer's directions for use.
   - Apply stabilization device at the time of VAD placement
   - Change device at intervals recommended by the manufacturer, usually every 7 days if loosened, or if drainage present
   - Perform device removal and replacement in conjunction with routine site care and dressing changes (see Vascular Access Site Care and Dressing Change)
     - Care must be exercised during device removal to stabilize VAD before new device is replaced; risk of VAD dislodgment is present during this step
     - Device may be removed with use of alcohol wipe to loosen adhesive

4. Cleanse skin with antiseptic solution. Apply skin preparation solution and allow to dry completely to promote secure adhesion of device to the skin.
5. Secure VAD to stabilization device prior to adhering device to the skin.

**Use of Sterile Tape or Surgical Strips**

1. Perform hand hygiene.
2. Don gloves.
3. Secure VAD hub to skin with sterile tape or sterile surgical strips; do not apply tapes or strips directly to catheter-skin junction or catheter material.

**Bibliography**


Joint Stabilization

Policy
Joint stabilization devices are used to decrease complications associated with vascular access device (VAD) placement near areas of flexion.

The frequency of extremity assessment and removal of the joint stabilization device is to be established by the organization.

Supplies
- Single-patient-use arm board, finger, or limb splint
- Material for padding
- Tape

Procedure
1. Determine the appropriate device for the area to be stabilized.
2. Explain purpose of device to patient and instruct patient on signs and symptoms to report (eg, discomfort, pressure, pain).
3. Apply joint stabilization device according to manufacturer’s directions for use with attention to:
   - Allowing the ability to visually inspect and assess the VAD site and vein path
   - Preventing any restriction of circulation
   - Preventing pressure that could cause skin breakdown or nerve damage
   - Promoting as much function as possible to the extremity
   - Adding padding material as needed for patient comfort
4. Assess circulation and skin at regular intervals for development of ulcers due to pressure from device and restriction of circulation.

Bibliography

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Administration Set Change

Policy
Administration sets, including add-on devices, will be changed at established intervals depending on the type of administration and infusate.

Administration set changes, including add-on devices, will coincide with peripheral vascular access device replacement and central vascular access device insertion.

Administration sets, including add-on devices, will be changed immediately when contamination is suspected or when product integrity is compromised.

Administration sets used with lipid-based infusates, such as intravenous fat emulsions (IVFE), will be free of di-ethylhexyl-phthalate (DEHP).

Supplies
- Antiseptic wipes (eg, alcohol)
- Prescribed infusate
- Administration set
- Add-on devices (eg, needleless connector, extension set, filter)
- Label

Procedure
1. Perform hand hygiene.
2. Inspect supplies for integrity and sterility.
   - Infusate
   - Administration set
   - Add-on devices
3. Assemble administration set.
   - Close clamp on new administration tubing
   - Attach add-on devices to administration set
4. Prepare solution container.
   - Remove protective covers from administration set’s spike and infusate’s access port
   - Insert spike into solution container
   - Hang container (for an ambulatory electronic infusion device [EID], place container in carrying case)
5. Prime new administration set, including add-on devices and extension tubing.
   • Squeeze drip chamber to fill to manufacturer’s mark (approximately one-third to one-half full)
   • Slowly open clamp to prime administration set while holding distal end of administration set upright, allowing filter to hang upside-down
   • Prime entire length of administration set, and clamp
   • Note for ambulatory EID: infusate may need to be primed using pump-priming function

6. Connect administration set to existing catheter:
   • Clamp existing administration set
   • Clamp catheter to prevent accidental exposure to blood and to reduce risk for air embolism, and disconnect from catheter hub
   • Disinfect catheter hub with antiseptic wipes
   • Remove protective cap from distal end of administration set and attach to catheter hub
   • Unclamp catheter to resume infusion
   • Discard existing administration set and infusate

   • Slowly open clamp of administration set to begin infusion or turn on EID
   • Monitor drops per minute manually by counting drops to ensure proper administration rate, or observe EID for 1-2 minutes to ensure proper administration rate

8. Label administration set with date and time.

Table 1. Administration Set Change Frequency by Administration Type

<table>
<thead>
<tr>
<th>Administration Type</th>
<th>Administration Set</th>
<th>Set Change Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous</td>
<td>Primary and secondary sets</td>
<td>No more frequently than every 96 hours</td>
</tr>
<tr>
<td>Intermittent</td>
<td>Primary and secondary sets</td>
<td>Every 24 hours</td>
</tr>
</tbody>
</table>

Table 2. Administration Set Change Frequency by Infusate

<table>
<thead>
<tr>
<th>Type of Infusate</th>
<th>Administration Set</th>
<th>Set Change Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood and blood components</td>
<td>Continuous or single unit</td>
<td>At end of 4 hours</td>
</tr>
<tr>
<td>Intravenous fat emulsion (IVFE)</td>
<td>Continuous or single dose</td>
<td>Every 24 hours</td>
</tr>
<tr>
<td>Parenteral nutrition</td>
<td>Cyclic or intermittent delivery</td>
<td>Every 24 hours</td>
</tr>
<tr>
<td></td>
<td>Continuous with IVFE</td>
<td>Every 24 hours</td>
</tr>
<tr>
<td></td>
<td>Continuous without IVFE</td>
<td>Every 96 hours</td>
</tr>
<tr>
<td>Propofol</td>
<td>Continuous or intermittent</td>
<td>Every 12 hours</td>
</tr>
</tbody>
</table>

Note: Change administration set immediately if contamination is suspected or product integrity is compromised.

Bibliography


Flushing and Locking

Policy
Flushing is performed prior to each infusion to assess vascular access device (VAD) function, after each infusion to prevent mixing of incompatible medications and solutions, and after blood sampling.

Locking is performed to maintain device patency and prevent occlusion by instilling solution in an intermittently used VAD.

Single-use flushing and locking systems will be used.

A VAD should never be forcibly flushed. To prevent damage, the patency of the VAD should be assessed using a 10-mL syringe.

Supplies
- Gloves
- Antiseptic wipes (eg, alcohol)
- Preservative-free 0.9% sodium chloride (USP) prefilled syringe(s)
- Heparin lock solution (10-100 units/mL) prefilled syringe(s)
- 10-mL syringe(s)

Procedure
1. Perform hand hygiene.
2. Gather supplies.
3. Don gloves.

Flushing
4. Disinfect needleless connector with antiseptic wipe using friction and a scrubbing motion; allow to dry completely.
5. Attach syringe of preservative-free 0.9% sodium chloride (USP) to needleless connector while maintaining the sterility of the syringe tip.
6. Open VAD clamp, if present.
7. Slowly aspirate until brisk blood return is obtained.
8. Slowly inject preservative-free 0.9% sodium chloride (USP) into VAD, noting any resistance or sluggishness of flow.
   • Never inject against resistance
   • VAD will require further evaluation if unable to flush freely
9. Remove syringe and discard.
10. Administer prescribed infusate or proceed to locking procedure.
Locking

11. Disinfect needleless connector with antiseptic wipe using friction and a scrubbing motion; allow to dry completely.

12. Attach syringe of locking solution to needleless connector while maintaining the sterility of the syringe tip.

13. Slowly inject solution into catheter.

14. Follow clamping sequence to reduce blood reflux based on type of needleless connector used:
   • Positive-pressure needleless connector: clamp after syringe disconnection
   • Negative-pressure needleless connector: maintain pressure on the syringe plunger while closing the clamp on the VAD or extension set, then disconnect the syringe
   • Neutral displacement needleless connector: is not dependent on flushing technique and can be clamped either before or after syringe disconnection

15. Discard syringe and used supplies in appropriate receptacles.

16. Remove gloves and perform hand hygiene.

Bibliography


Vascular Access Site Care and Dressing Change

Policy
Short peripheral access site care and dressing changes will be performed when the integrity of the dressing is compromised; if moisture, drainage, or blood is present; or for further assessment if site infection or inflammation is suspected.

Central vascular access device (CVAD) and midline catheter site care and dressing changes will be performed at established intervals, and immediately when the integrity of the dressing is compromised; if moisture, drainage, or blood is present; or for further assessment if site infection or inflammation is suspected.

Gauze dressings will be changed every 2 days.

Transparent semipermeable membrane (TSM) dressings will be changed every 5-7 days.

Supplies

Short peripheral catheter
- Gloves, nonsterile
- Antiseptic solution
- Securement
  - Stabilization device
  - Surgical strips
  - Tape, sterile
- Site dressing
  - Gauze pad and tape
  - TSM dressing
- Label

CVAD or Midline Catheter
- Mask
- Gloves, nonsterile
- Gloves, sterile
- Antiseptic solution
- Tape measure, sterile
- Securement
  - Stabilization device
  - Surgical strips
  - Tape, sterile
- Site dressing
  - Antimicrobial dressing
  - Gauze pad and tape
  - TSM dressing
• Label
NOTE: a central line dressing kit is recommended.

Procedure
Short peripheral catheter

1. Perform hand hygiene.
2. Gather supplies.
3. Explain procedure to patient.
4. Don gloves.
5. Assess insertion site for redness, tenderness, swelling, or drainage.
6. Remove existing dressing, beginning at device hub and gently pulling the dressing perpendicular to the skin toward the insertion site.
7. Remove stabilization device.
8. Cleanse skin with antiseptic solution; allow to dry completely.
   • Chlorhexidine solution (preferred): apply using a back-and-forth motion for at least 30 seconds
   • Povidone-iodine: apply using swabsticks in a concentric circle beginning at the catheter insertion site, moving outward; it must remain on the skin for at least 2 minutes or longer to dry completely for adequate antisepsis
9. Apply stabilization device, surgical strips, or sterile tape.
10. Apply TSM (or gauze and tape) dressing to insertion site.
11. Discard used supplies in appropriate receptacles.
12. Remove gloves and discard.
13. Perform hand hygiene.
14. Label dressing with date, time, and initials of nurse performing procedure.

CVAD or Midline Catheter

1. Perform hand hygiene.
2. Gather supplies.
3. Explain procedure to patient.
4. Don mask.
5. Assemble supplies on sterile field.
6. Don nonsterile gloves.
7. Assess insertion site for redness, tenderness, swelling, or drainage.
8. Remove existing dressing, beginning at device hub and gently pulling the dressing perpendicular to the skin toward the insertion site.
9. Remove stabilization device.
10. Remove gloves.
11. Perform hand hygiene.
12. Don sterile gloves.
13. Measure external length of CVAD or midline catheter.
14. Cleanse skin with antiseptic solution; allow to dry completely.
   - Chlorhexidine solution (preferred): apply using a back-and-forth motion for at least 30 seconds
   - Povidone-iodine: apply using swabsticks in a concentric circle beginning at the catheter insertion site, moving outward; it must remain on the skin for at least 2 minutes or longer to dry completely for adequate antisepsis
15. Apply antimicrobial dressing, if used.
16. Apply stabilization device, surgical strips, or sterile tape.
17. Apply TSM (or gauze and tape) dressing to insertion site.
18. Discard used supplies in appropriate receptacles.
19. Remove gloves and discard.
20. Perform hand hygiene.
21. Label dressing with date, time, and initials of nurse performing procedure.
22. Document procedure in patient’s permanent medical record.
**Bibliography**


Vascular Access Device Removal

Policy
A vascular access device (VAD) will be removed when therapy is completed, as ordered by the licensed independent practitioner (LIP), for short peripheral or arterial catheter replacement, when contamination or complication is suspected, or when tip location is no longer appropriate for the prescribed therapy.

A VAD placed in an emergency situation will be replaced as soon as possible and not later than 48 hours.

Procedure
Short peripheral or arterial catheter
1. Perform hand hygiene.
2. Gather supplies.
   • Gloves, nonsterile
   • Gauze, nonsterile
   • Tape
3. Explain procedure to patient.
4. Don gloves.
5. Place patient in sitting or recumbent position.
6. Discontinue administration of all infusates.
7. Remove dressing from insertion site.
8. Remove stabilization device or sutures, if present.
10. Apply gauze to insertion site. With dominant hand, slowly remove catheter using gentle, even pressure.
11. Apply pressure to site with gauze, or until hemostasis is achieved.
   • Short peripheral catheter: minimum of 30 seconds
   • Arterial catheter: minimum of 3-5 minutes
12. Apply gauze and tape dressing to venipuncture site.
13. Change dressing every 24 hours until exit site is healed.
14. Assess integrity of removed catheter. Compare length of catheter to original insertion length to ensure entire catheter is removed.
Midline catheter and nontunneled CVAD removal:

1. Perform hand hygiene.

2. Gather supplies.
   - Personal protective equipment (PPE), as indicated
   - Gloves, nonsterile
   - Suture removal set, as needed
   - Gauze, sterile
   - Petroleum based ointment, sterile
   - Transparent semipermeable membrane (TSM) dressing

3. Explain procedure to patient.
   - Educate patient in Valsalva's maneuver for all CVAD removal procedures
   - If a Valsalva's maneuver is contraindicated, have the patient exhale during the procedure (see Air Embolism)

4. Don gloves.

5. Place patient in sitting or recumbent position.

6. Discontinue administration of all infusates.

7. Remove dressing from insertion site.

8. Remove stabilization device or sutures, if present.


10. Apply gauze to insertion site. With dominant hand, slowly remove catheter using gentle, even pressure.
    - Use extreme caution when removing central nontunneled catheters to prevent the occurrence of air embolism
    - Discontinue removal if resistance is met, and notify LIP

11. Apply pressure to site with gauze for a minimum of 30 seconds, or until hemostasis is achieved.

12. Apply petroleum-based ointment to exit site, cover with gauze and TSM dressing.

13. Patient should remain in sitting or recumbent position for 30 minutes post-CVAD removal.

14. Change dressing every 24 hours until exit site is healed.

15. Assess integrity of removed catheter. Compare length of catheter to original insertion length to ensure entire catheter is removed.

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7. Infusion-Related Complications

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Central Vascular Access Device Occlusion

Policy
The nurse will address preventive measures, identify signs and symptoms of, and promptly intervene when central vascular access device (CVAD) occlusion is suspected.

A thorough assessment of the patient and the CVAD for the potential cause of an occlusion will be performed, and the appropriate intervention will be performed to restore catheter patency.

Catheter clearance agents, such as precipitate-clearing or thrombolytic (declotting) agents, are used only with CVADs.

Prevention
  - Use a positive-pressure flushing technique with negative-pressure needleless connectors to prevent the reflux of blood into the catheter tip
  - Flush visible blood from CVAD
  - Flush after blood draws
  - Flush between medication/solution administration (see Flushing and Locking) to prevent precipitate formation from mixing of incompatible infusates
  - Change filters on a routine basis
  - Ensure all clamps are open before initiating infusion

Assessment
  - Assess for signs of partial or complete occlusion, including:
    - Sluggish infusion or flushing
    - Lack of brisk blood return
    - Increasing occlusion alarms on an electronic infusion device (EID)
    - Complete inability to infuse or flush (complete occlusion)
  - Assess and attempt to identify potential causes of occlusion
    - Mechanical:
      - External: tight suture, clamped catheter, kinked tubing, obstructed filter, nonfunctioning needleless connector
      - Internal: catheter malposition, kinked catheter, pinch-off syndrome
    - Nonthrombotic: lipid buildup from 3-in-1 parenteral nutrition admixtures, drug precipitate
    - Thrombotic: most common, due to fibrin buildup, blood clots within or around catheter (eg, intraluminal occlusion or fibrin sheath/tail)
  - Identify appropriate catheter-clearance agent (precipitate-clearing or declotting agent).
• Assess patient for any contraindications to use a selected catheter-clearance agent

**Intervention**

• Follow single-syringe method or stopcock method for complete occlusions as these are instillation methods that use a negative-pressure approach

• Follow direct instillation method for partial or nonthrombotic occlusions when CVAD can still be flushed but blood aspiration is not possible or flow is sluggish

• Use a volume of the precipitate-clearing or declotting agent based on the manufacturer’s directions for use or in an amount approximating the internal lumen volume of the CVAD and any add-on devices

• Check the CVAD manufacturer’s directions for use when considering instillation of alcohol solutions such as ethanol, as they may damage catheters made of some types of polyurethane

**Single Syringe Method: Use with Complete Occlusions**

1. Perform hand hygiene.

2. Gather supplies.
   • Gloves, nonsterile
   • Antiseptic solution
   • 10-mL syringe with precipitate-clearing or declotting agent
   • 10-mL syringe preservative-free 0.9% sodium chloride (USP)
   • Needleless connector
   • Tape

3. Explain procedure to patient.

4. Don gloves.

5. Disinfect needleless connector with antiseptic solution; allow to dry completely.

6. Clamp CVAD, if appropriate.

7. Attach syringe with precipitate-clearing or declotting agent to needleless connector.

8. Unclamp CVAD and while holding syringe vertically, gently pull plunger back to approximately 8-mL mark.

9. While maintaining syringe in vertical position, slowly release the plunger. Make sure the solution is in the end of the syringe nearest the CVAD. Do not apply pressure to plunger. Clamp CVAD.
10. Leave syringe in place and secure with tape. Label syringe “Do not use—declotting” with date, time, and nurse’s initials.

11. Allow solution to dwell according to manufacturer’s directions for use.

12. After appropriate dwell time, unclamp CVAD and attempt to aspirate blood.
- A free-flowing blood return indicates patency
- If patency is reestablished, withdraw a total of 4-5 mL of blood, clamp CVAD, and remove and discard syringe
- Repeat procedure if patency is not achieved
- Notify LIP if unable to achieve patency

13. Attach 10-mL syringe of preservative-free 0.9% sodium chloride (USP), unclamp, and flush CVAD (see Flushing and Locking).

14. Resume ordered therapy or lock catheter as appropriate.

15. Dispose of used supplies in appropriate receptacles.

16. Remove gloves.

17. Perform hand hygiene.


**Stopcock Method: Use with Complete Occlusions**

1. Perform hand hygiene.

2. Gather supplies.
   - Gloves, nonsterile
   - Antiseptic solution
   - 3-way stopcock
   - 10-mL syringe, sterile
   - 10-mL syringe with precipitate-clearing or declotting agent
   - 10-mL syringe, preservative-free 0.9% sodium chloride (USP)
   - Needleless connector(s)

3. Explain procedure to patient.

4. Don gloves.

5. Disinfect junction of CVAD and needleless connector with antiseptic solution; allow to dry completely.

6. Clamp catheter.
7. Remove needleless connector and attach sterile stopcock, turned off from the patient to the CVAD hub.
8. Attach empty 10-mL syringe to 1 port of stopcock.
9. Attach 10-mL syringe of precipitate-clearing or declotting solution to remaining stopcock port.
10. Open stopcock port connected to empty syringe.
11. Pull plunger back on empty syringe to approximately 8-mL mark while maintaining plunger position; close port, creating negative pressure within catheter lumen.
12. Open stopcock connected to syringe with precipitate-clearing or declotting agent, allowing solution to enter into CVAD.
   • Procedure steps 9-11 may need to be repeated until solution is pulled into CVAD
13. Secure device to patient and label “Do not use—declotting” with date, time, and nurse’s initials.
   • May opt to remove stopcock and syringes and replace with sterile needleless connectors during dwell time
14. Allow solution to dwell according to manufacturer’s directions for use.
15. After appropriate dwell time, disinfect needleless connector with antiseptic solution; allow to dry completely.
16. Attach empty 10-mL syringe and attempt to aspirate blood.
   • A free-flowing blood return indicates patency
   • If patency is reestablished, withdraw a total of 4-5 mL of blood, clamp CVAD, and remove and discard syringe
   • Repeat procedure if patency is not achieved
   • Notify LIP if unable to achieve patency
17. Attach 10-mL syringe of preservative-free 0.9% sodium chloride (USP), unclamp, and flush CVAD (see Flushing and Locking).
18. Resume ordered therapy or lock catheter as appropriate.
19. Dispose of used supplies in appropriate receptacles.
20. Remove gloves.
22. Document procedure and outcome in patient’s permanent medical record.

Infusion-Related Complications
Direct Instillation Method: Use with Partial Thrombotic or Nonthrombotic Occlusions

1. Perform hand hygiene.
2. Gather supplies.
   • Gloves, nonsterile
   • Antiseptic solution
   • 10-mL syringe
   • 10-mL syringe with precipitate-clearing or declotting agent
   • 10-mL syringe of preservative-free 0.9% sodium chloride (USP)
   • Needleless connector
3. Explain procedure to patient.
4. Don gloves.
5. Disinfect needleless connector with antiseptic solution; allow to dry completely.
6. Attach syringe with precipitate-clearing or declotting solution.
7. Unclamp CVAD, if appropriate, and slowly inject precipitate-clearing or declotting agent. Do not force solution into CVAD.
8. Clamp CVAD. Label CVAD “Do not use – declotting” with date, time, and nurse’s initials.
9. Allow solution to dwell according to the manufacturer’s directions for use.
10. After appropriate dwell time, disinfect needleless connector with antiseptic solution; allow to dry completely.
11. Attach empty 10-mL syringe and attempt to aspirate blood.
   • A free-flowing blood return indicates patency
   • If patency is reestablished, withdraw a total of 4-5 mL of blood, clamp CVAD, and remove and discard syringe
   • Repeat procedure if patency is not achieved
   • Notify LIP if unable to achieve patency
12. Attach 10-mL syringe of preservative-free 0.9% sodium chloride (USP), unclamp, and flush CVAD (see Flushing and Locking).
13. Resume ordered therapy or lock catheter as appropriate.
14. Dispose of used supplies in appropriate receptacles.
15. Remove gloves.
16. Perform hand hygiene.


**Agents for CVAD Clearance of a Drug Precipitate**

<table>
<thead>
<tr>
<th>Drug Precipitate</th>
<th>Clearing Agent</th>
<th>Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low drug pH (1-5)</td>
<td>Hydrochloric acid (0.1N)</td>
<td></td>
</tr>
<tr>
<td>High drug pH (9-12)</td>
<td>Sodium bicarbonate</td>
<td></td>
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<tr>
<td>Intravenous fat emulsion</td>
<td>Sodium hydroxide or 70% ethanol</td>
<td>Some catheters may be damaged by the use of ethanol alcohol; check manufacturer’s directions for use</td>
</tr>
</tbody>
</table>

**Bibliography**


Vascular Access Device-Related Infection

Policy
The nurse will address preventive measures, identify signs and symptoms of, and promptly intervene when vascular access device (VAD)-related infection is suspected.

Risk factors for infection and catheter-associated bloodstream infection include:
- Inadequate skin antisepsis prior to VAD insertion
- Multiple manipulations of infusion delivery system
- Patient age, condition, acuity
- Presence of secondary infection
- Education and skill level of clinician
- Inadequate VAD insertion technique
- Inadequate care and maintenance practices

Prevention
- Perform hand hygiene prior to placing and before providing any VAD-related interventions
- Use maximal sterile barrier precautions during central vascular access device (CVAD) insertion
- Choose the optimal CVAD site for placement; the subclavian vein is the preferred site for nontunneled catheters
- Use chlorhexidine for skin antisepsis prior to CVAD insertion; it is the preferred skin antiseptic
- Perform skin antisepsis prior to peripheral catheter insertion using an antiseptic solution
- Disinfect needleless connectors prior to access
- Maintain aseptic technique during all infusion therapy administrations and VAD care
- Change administration set and any add-on devices at recommended intervals
- Minimize use of add-on devices
- Remove VAD when no longer needed
- Teach patients/caregivers who will self-manage their VAD/infusions: hand hygiene, aseptic technique, disinfection of needleless connectors

Assessment
Identify signs and symptoms of exit site infection:
- Tenderness
- Erythema within 2 cm of catheter-skin junction
- Induration within 2 cm of catheter-skin junction
- Purulence at exit site
Identify signs and symptoms of port-pocket or tunnel-tract infection:
• Erythema
• Necrosis of skin over reservoir of implanted port
• Tenderness
• Induration
• Purulent exudate from needle access site
• Purulent exudate from subcutaneous port pocket

Identify signs and symptoms of infection in the tract of a tunneled catheter:
• Erythema
• Tenderness
• Induration in tissues overlying catheter and greater than 2 cm from catheter exit site

Identify signs and symptoms of catheter-related bloodstream infection:
• Acute onset of fever, chills, and hypotension
• No other apparent source of infection but the catheter

**Intervention**

If signs and symptoms of exit site infection are present:
• Notify licensed independent practitioner (LIP) of signs and symptoms
• Obtain culture of purulent exudate
• Apply topical ointment to affected area
• Apply warm, moist compresses
• Initiate oral or parenteral anti-infective therapy

If signs and symptoms of port-pocket or tunnel-tract infection are present:
• Notify LIP of signs and symptoms
• Anticipate removal of device

If signs and symptoms of catheter-related bloodstream infection are present:
• Notify LIP immediately
• Obtain blood cultures from device and from a separate peripheral vascular access site, as ordered (see *Culturing for Infusion-Related Infections* )
• Culture infusate if there is possibility of infusion-related contamination
• Initiate parenteral anti-infective therapy as ordered
• If unsuccessful in treating suspected infusion-related infection, VAD may need to be removed
Additional interventions

- Monitor patient including ongoing assessment of VAD site, vital signs, review of laboratory findings, and response to interventions
- Perform site care and maintenance if catheter is not removed
- Replace administration sets and solution containers per organizational policy

Document in patient’s permanent medical record:

- Observations and patient assessment
- LIP notification
- Interventions taken and outcome
- Patient’s condition and response to interventions

Complete an Unusual Occurrence or Sentinel Event Report as established by the organization.

Bibliography


Catheter-Associated Venous Thrombosis

Policy
The nurse will address preventive measures, identify signs and symptoms of, and promptly intervene when catheter-associated venous thrombosis is suspected.

Risk factors associated with catheter-associated venous thrombosis:
• Presence of chronic diseases that produce a hypercoagulable state such as cancer, diabetes, irritable bowel syndrome, end-stage kidney failure
• Known presence of genetic coagulation abnormalities (eg, Factor V Leiden, prothrombin mutation)
• Pregnancy or the use of oral contraceptives, surgery, and immobility
• History of multiple central vascular access devices (CVADs), especially with difficult or traumatic insertion and the presence of other intravascular devices (eg, pacemakers)
• Catheter material, diameter, and number of lumens

Prevention
• Ensure optimal catheter tip location in vena cava
• Use catheters with small diameter

Assessment
Assess patient for signs and symptoms of catheter-associated venous thrombosis: be aware that the majority of catheter-associated venous thromboses are clinically silent, with no overt signs and symptoms, and can lead to pulmonary emboli.
• Pain in the extremity, shoulder, neck, or chest
• Edema in the extremity, shoulder, neck, or chest
• Engorged peripheral veins on the extremity, shoulder, neck, or chest wall
• Difficulty with neck or extremity motion
• Signs and symptoms of pulmonary emboli including dyspnea, apprehension, pleuritic discomfort or pain, diaphoresis, tachycardia, cyanosis

Intervention
If catheter-associated venous thrombosis or pulmonary emboli are suspected:
• Notify licensed independent practitioner (LIP) immediately.
• Initiate emergency interventions and basic life support as needed (eg, severe dyspnea, suspected embolus)
  ° Initiate “code” (eg, hospital)
  ° Call 911 (eg, outpatient/physician office/home)
• Continue to monitor vital signs and observe patient
• Perform interventions and treatments as ordered
• Administer oxygen as ordered
• Obtain radiographic studies as ordered to confirm catheter placement and presence of venous thrombosis
• Initiate anticoagulant therapy or thrombolytic therapy as ordered

Document in patient’s permanent medical record:
• Observations and patient assessment
• LIP notification
• Interventions taken and outcome
• Patient’s condition and response to interventions

Complete an Unusual Occurrence or Sentinel Event Report according to organizational policy.

Bibliography


Phlebitis

Policy
The nurse will address preventive measures, identify signs and symptoms of, and promptly intervene when phlebitis is suspected.

Phlebitis may occur up to 48 hours after vascular access device (VAD) removal.

Risk factors for phlebitis include:
- Multiple manipulations of infusion delivery system
- Large gauge and length of catheter
- Catheter material and configuration
- Failure to stabilize VAD adequately
- Patient age, condition, acuity
- Administration of irritating infusates (acid/alkaline pH and high osmolarity)
- Inadequate VAD insertion technique
- Inadequate skin antisepsis
- Inadequate care and maintenance practices
- Extended dwell time

Prevention
- Use the smallest-gauge and -length catheter to accommodate the prescribed therapy
- Avoid placing catheter in areas of flexion
- Consider a CVAD for infusates with a pH less than 5 or greater than 9, or osmolarity greater than 600 mOsm, or final dextrose concentration less than 10%
- Perform thorough skin disinfection before catheter insertion
- Allow antiseptic to dry completely before inserting catheter
- Adhere to aseptic technique with all infusion access and medication/solution administration
- Stabilize VAD to minimize movement at the insertion site

Assessment
- Assess patient and insertion site on a routine basis by palpating skin gently through the dressing and observing skin and insertion site for signs of phlebitis, including:
  - Pain/tenderness at site
  - Erythema
  - Warmth
  - Swelling
  - Induration
  - Purulent drainage
  - Palpable venous cord
Interventions

- Discontinue infusion
- Remove catheter
- Assess severity of phlebitis using a standardized scale
- Determine the potential cause of the phlebitis
  - Chemical
  - Mechanical
  - Bacterial
- Notify licensed independent practitioner (LIP) regarding degree of phlebitis
- Apply thermal compress to phlebitic area for 20-minute periods, 3-4 times per day, with LIP’s order
- Reassess vascular access needs
- Replace short peripheral catheter in opposite extremity
- Consider CVAD if irritating fluids is probable cause
- Observe site for signs of postinfusion phlebitis, such as inflammation, erythema, edema, and drainage; palpate site for warmth and induration
- Document in patient’s permanent medical record

Maintain statistical data on phlebitis rates, including degree, incidence, cause, and correction.

Phlebitis rate is calculated as follows:

\[
\frac{\text{Number of phlebitis incidents}}{\text{Total number of peripheral catheters}} \times 100 = \% \text{ peripheral phlebitis}
\]

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<th>Clinical Criteria</th>
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<td>Palpable venous cord &gt; 1 inch in length</td>
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<tr>
<td></td>
<td>Purulent drainage</td>
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</tbody>
</table>

**Phlebitis Scale**
Bibliography


Infiltration and Extravasation

Policy
The nurse will address preventive measures, identify signs and symptoms of, and promptly intervene when infiltration and extravasation are suspected.

If a vesicant medication or solution must be administered peripherally it will be done with the collaboration of the licensed independent practitioner (LIP), nurse, and patient and/or caregiver.

Risk factors include:
- Multiple manipulations of infusion delivery system
- Large gauge and length of catheter
- Failure to stabilize VAD adequately
- Patient age, condition, acuity
- Administration of irritating infusates/solutions (acid/alkaline pH and high osmolarity)
- Infusion history
- Inadequate VAD insertion technique
- Inadequate care and maintenance practices
- Extended dwell time

Prevention
- Use the smallest-gauge and shortest catheter to accommodate the prescribed therapy
- Avoid placing catheter in areas of flexion
- Consider a central vascular access device (CVAD) for infusates with a pH less than 5 or greater than 9, or osmolarity greater than 600 mOsm, or final dextrose concentration greater than 10%
- Infuse irritating infusates into large peripheral veins; avoid use of veins in hand, fingers
- Stabilize catheter to minimize movement at the insertion site
- Ensure patency of VAD prior to infusion, including assessment of brisk blood return upon aspiration
- Check patency of VAD during vesicant administration, aspirating for blood return every 3-4 mL
- Administer vesicants through the lowest injection port of a free-flowing compatible solution
- Instruct patient to immediately report any pain, burning, or swelling with infusion administration
- Teach home care patients to secure administration set on skin to avoid pulling at VAD insertion site and how to perform activities of daily living (ADL) while protecting catheter site and infusion
Assessment

General

• Do not rely on alarms from electronic infusion devices (EIDs) to detect infiltration or extravasation
• Teach patient and/or caregiver signs and symptoms to report and the importance of immediate reporting

Short Peripheral and Midline Catheters

Assess all short peripheral and midline catheters for immediate or delayed signs and symptoms of infiltration/extravasation including, but not limited to:

• Changes in skin color, including blanching, bruising, or redness surrounding insertion site
• Edema in any direction from the insertion site
• Changes in skin temperature, including coolness or warmth
• Pain, burning, or stinging with injection or infusion
• Development of blisters
• Impaired ability to move fingers, hand, or entire extremity
• Numbness, tingling, and other signs of paresthesia in the extremity
• Fluid leakage from insertion site
• Slowed capillary refill

Central Vascular Access Devices

Assess for immediate or delayed signs and symptoms of infiltration and extravasation including, but not limited to:

• Loss of blood return upon aspiration
• Resistance to syringe injection
• Altered or stopped fluid flow by gravity
• Leaking from the insertion site
• Edema in the neck, shoulder, or chest surrounding the CVAD exit site
• Pain or discomfort of any kind at the insertion site, tip location, or along the CVAD’s venous pathway

Interventions (nonvesicant solutions)

• Discontinue infusion immediately and remove catheter
  ° Apply pressure at site to prevent bleeding and achieve hemostasis
• Institute appropriate supportive treatments as needed, such as elevation of the extremity or thermal applications
• Teach patient to report any progression of signs and symptoms such as changes in extremity mobility, sensation, elevated temperature, and signs of infection
Policies and Procedures for Infusion Nursing

Extravasation (vesicant solutions)

• Discontinue infusion immediately
• If catheter must be removed:
  ° Aspirate for infused medication before removing catheter
  ° Apply gentle pressure at site to prevent bleeding and further tissue damage
• Notify LIP and obtain specific orders to treat the extravasation
• Treatment of extravasation depends on the type of medication and severity of the complication and may include thermal manipulation, use of antidotes, and surgical interventions
  ° Check drug manufacturer’s directions for use
  ° Thermal application
    ■ Application of heat or cold based on specific vesicant medication
    ■ Cooling is recommended for alkylating agents, anthracyclines, antitumor antibiotics, and taxanes; use has been reported with propofol, vancomycin, nafcillin, doxycycline, calcium, potassium, promethazine, and parenteral nutrition solution
    ■ Heat is recommended for plant alkaloids, vasoconstricting agents (eg, dopamine, dobutamine, epinephrine)
  ° Antidotes for treatment of extravasation injuries include:
    ■ Sodium thiosulfate for alkylating agents
    ■ Dexrazoxane (Totect®) for anthracyclines
    ■ Hyaluronidase for plant alkaloids, dextrose, electrolytes (eg, calcium, potassium, sodium bicarbonate), and antibiotics (eg, nafcillin, vancomycin)
    ■ Phenyltolamine for vasopressor agents, including dobutamine, dopamine, epinephrine, metaraminol, norepinephrine, phenylephrine
• Reassess vascular access needs
• Replace short peripheral catheter in opposite extremity
• Continue to monitor site, as clinically significant complications can result from infiltration or extravasation
• Observe site for signs and symptoms of compartment syndrome, nerve injury, blisters, skin sloughing, tissue necrosis, functional and sensory loss

Photograph affected area of extravasation at the following intervals:

• At time of injury
• 24 hours after injury
• 48 hours after injury
• 1 week after injury
Document in patient’s permanent medical record:
- Date and time of infiltration/extravasation
- Catheter type and size
- Whether insertion site is new or preexisting
- Drug administered, method of administration, and estimated volume of fluid that escaped into the tissue
- Patient complaints or experience during the extravasation
- Appearance of access site
- Treatment measures taken and outcome

Complete Unusual Occurrence or Sentinel Event Report according to organizational policy.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Clinical Criteria</th>
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<td>Infiltration of any amount of blood products, irritant, or vesicant</td>
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Infiltration Scale
Bibliography


Allergic Reaction and Anaphylaxis

Policy
Patients will be assessed for current allergies and risk factors for allergic reactions and monitored for any reactions during the course of care.

Whenever possible, the patient should receive the first dose of an infusion medication in a controlled environment (eg, hospital, ambulatory infusion center) with access to emergency medical equipment and medications.

Common causes of anaphylaxis include:
- Foods such as nuts, fish, shellfish, milk, eggs, and sesame
- Latex
- Medications (eg, penicillin, biologic agents)
- Blood and blood components

Prevention
- Obtain a thorough allergy and drug history; note any cross-sensitivity
- Identify risk factors for anaphylaxis, including history of severe drug reactions and family history of same, and when administering blood/blood components and the first dose of an infusion medication with a risk for severe allergic reactions/anaphylaxis
- Place identification bracelet on patient to identify allergies
- Document allergy in the patient’s permanent medical record

Assessment
- Assess for changes in vital signs and for signs and symptoms of allergic reaction or anaphylaxis, including:
  - Neurological - dizziness, headache, weakness, syncope, seizures
  - Psychiatric - anxiety, feeling of impending doom
  - Respiratory - oropharyngeal or laryngeal edema, dyspnea, wheezing, bronchospasm, tachypnea, cyanosis, respiratory arrest
  - Cardiovascular - tachycardia, hypotension, arrhythmias, chest pain, infarction, or cardiac arrest
  - Cutaneous - flushing, erythema, pruritus, urticaria, angioedema
  - Gastrointestinal - nausea, vomiting, diarrhea, abdominal cramps

Interventions
1. Stop infusion immediately.
2. Discontinue any medication suspected of causing reaction.
3. Maintain vascular access for emergency supportive therapies.
4. Initiate basic life support as needed.
   • Initiate “code” (eg, hospital)
   • Call 911 (eg, outpatient/physician office/home)

5. Notify licensed independent practitioner (LIP) immediately.

6. Prepare 0.9% sodium chloride via new administration set for immediate infusion.

7. Perform interventions and treatments as ordered.
   • Administer emergency medications such as epinephrine or steroids as ordered

8. Monitor patient’s vital signs.

9. Document in patient’s permanent medical record:
   • Observations and patient assessment
   • Licensed independent practitioner (LIP) notification
   • Interventions taken and outcome
   • Patient’s condition and response to interventions

10. Complete an Unusual Occurrence or Sentinel Event Report according to organizational policy.

Bibliography


Air Embolism

Policy
The nurse will address preventive measures, identify signs and symptoms of, and promptly intervene when an air embolism is suspected.

Risk factors for air embolism include:
  • Catheter fracture
  • Disconnection between catheter connections
  • Presence of a persistent skin-to-vein tract following central vascular access device (CVAD) removal
  • Deep inspiration during CVAD insertion or removal
  • Lack of adequate catheter stabilization

Prevention
During catheter insertion:
  • Place patient in Trendelenburg position when axillosubclavian or jugular insertion sites are used

During catheter use:
  • Use luer-lock connections on catheter–administration set junctions
  • Maintain adequate hydration; fluid volume deficit increases risk
  • Trace all lines from the catheter hub to the solution container to prevent misconnections
  • Place patient in a position with the vascular access device (VAD) exit site at or below heart level when changing administration sets or needleless connectors
    ◦ Ensure that administration sets and add-on devices are primed with solution prior to attachment to VADs
    ◦ Close the clamp on the catheter’s external portion if present; when no clamp is present, instruct the patient to perform a Valsalva’s maneuver during the procedure
    ◦ Quickly disconnect the existing set or connector, remove the protective cap from the new one without contaminating the sterile male luer, and attach it securely to the catheter hub
    ◦ Use an air-eliminating filter on administration sets when appropriate
    ◦ Teach patients and caregivers who are managing a CVAD about care and maintenance, recognition of signs of air embolism, and appropriate interventions to take in the event of an occurrence
During CVAD removal:
- Position the patient with the catheter exit site at or below the level of the heart
- Instruct the patient to perform Valsalva's maneuver as the last catheter segment is withdrawn from the vein
  - Contraindications to use of Valsalva's maneuver include aortic stenosis, recent myocardial infarction, glaucoma, and retinopathy
- Place pressure on the site until hemostasis is achieved; apply an occlusive dressing consisting of sterile petroleum-based ointment, sterile gauze, and cover with tape or a transparent semipermeable membrane dressing
- Change dressing every 24 hours until exit site is healed
- Maintain the patient in a supine position for 30 minutes after catheter removal

Assessment
Assess patient for signs and symptoms of air embolism:
- Sudden onset of dyspnea
- Coughing
- Chest pain
- Hypotension
- Jugular venous distension
- Tachyarrhythmias
- Wheezing
- Tachypnea
- Altered mental status
- Altered speech
- Changes in facial appearance
- Numbness
- Paralysis
- A loud continuous churning sound heard over precordium during auscultation

Interventions
If air embolism is suspected:
- Place patient in left lateral decubitus position immediately if not contraindicated; this will minimize migration of emboli
- Locate source of air entry and resolve
  - If open or leaking infusion system, clamp VAD
  - If disconnected or damaged VAD, clamp VAD
  - Occlude exit site if VAD has been removed
- Initiate basic life support as needed
  - Initiate “code” (eg, hospital)
  - Call 911 (eg, outpatient/physician office/home)
• Notify licensed independent practitioner (LIP) immediately
• Continue to monitor vital signs and observe patient
• Perform interventions and treatments as ordered
• Administer oxygen as ordered

Document in patient’s permanent medical record:
• Observations and patient assessment
• LIP notification
• Interventions taken and outcome
• Patient’s condition and response to interventions

Complete an Unusual Occurrence or Sentinel Event Report according to organizational policy.

**Bibliography**


Policies and Procedures for Infusion Nursing

Catheter Embolism

Policy
The nurse will address preventive measures, identify signs and symptoms of, and promptly intervene when catheter embolism is suspected.

A catheter embolus can be introduced into the circulation when:
- A through-the-needle catheter is pulled backward then advanced forward, causing the catheter to be pierced or severed
- An over-the-needle catheter stylet is partially withdrawn, then reinserted into the catheter
- Excessive pressure used during catheter flushing causes fracture
- A catheter fracture occurs as a result of pinch-off syndrome
- Power injection of contrast media through a catheter not designed for that purpose

Prevention
- Do not withdraw a catheter through a needle during insertion
- Do not reinsert a stylet into a catheter
- Do not use power injection for vascular access devices that are not designed for this purpose
- Use a syringe size according to manufacturer’s directions for use to prevent catheter damage
- Assess device patency using a 10-mL syringe
- Inspect catheters for defects prior to use

Assessment
Assess patient for signs and symptoms of catheter embolism. Note that symptoms need to be evaluated in association with patient’s comorbidities and that severity of symptoms may depend on location of embolus:
- Palpitations
  - Arrhythmias
  - Dyspnea
  - Cough
  - Thoracic pain
- Review chest radiographs for evidence of catheter fragment, catheter pinch-off
- Be aware that catheter embolism may be asymptomatic
Interventions

If peripheral vascular access device embolism is suspected:

- Place tourniquet above venipuncture site, tight enough so as not to occlude arterial flow; check patient’s pulse at frequent intervals
- Place patient on strict bed rest
- Notify the licensed independent practitioner (LIP) immediately
- Monitor patient closely for signs of distress
- Perform interventions and treatments as ordered
- Have emergency resuscitative equipment available

If central vascular access device (CVAD) embolism is suspected:

- Place patient on strict bed rest
- Notify LIP immediately
- Monitor patient closely for signs of distress
- Perform interventions and treatments as ordered
- If radiographic extraction of catheter embolus is necessary, explain procedure to patient

Document in the patient’s permanent medical record:

- Observations and patient assessment
- LIP notification
- Interventions taken and outcome
- Patient’s condition and response to interventions

Complete an Unusual Occurrence or Sentinel Event Report according to organizational policy.

Bibliography


8. **Infusion-Related Procedures**

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Policies and Procedures for Infusion Nursing

Parenteral Medication and Solution Administration

Policy
Parenteral fluids and solutions are administered intravenously upon a licensed independent practitioner’s (LIP’s) orders.

Keep Vein Open (KVO) orders will include a prescribed rate of infusion.

Procedure

1. Obtain and review LIP’s order:
   • Type of fluid and volume
   • Medication and dosage
   • Route of administration
   • Frequency and duration

2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.

3. Explain procedure to patient.

4. Assess patient; obtain vital signs, if applicable.

5. Review laboratory results and assess for appropriateness of therapy.

6. Perform hand hygiene.

7. Check medication or solution label for patient’s name; medication and diluent; expiration or beyond-use date; inspect solution container for leaks, cracks, or particulate matter.

8. Aspirate for a positive blood return from vascular access device (VAD) to confirm patency.

9. Initiate administration of medication or solution as ordered.

10. Document in patient’s permanent medical record:
    • Type of infusate administered
    • Medication administered
    • Dosage
    • Route of administration, type of vascular access device
    • Rate of infusion administration
    • Type of flow-control device used
    • Date and time of administration
    • Patient’s response to medication and procedure
    • Administering nurse’s initials
**Bibliography**


Preparing Immediate-Use Parenteral Medications

Policy
Medications prepared outside the compounding pharmacy will be prepared using aseptic technique and will be administered within 1 hour of the start of preparation.

Single-dose containers (bottles, bags, vials, and syringes) are to be used within 1 hour of opening or needle entry. Any contents remaining in the container are not to be saved for further use.

Multidose vials with preservative will be used or discarded within 28 days from initial entry.

Medications will be prepared in a clean, orderly area such as a satellite pharmacy or nursing station medication room.

Procedure
1. Confirm order for medication and check compatibility with diluent, if indicated.
2. Perform hand hygiene.
3. Gather supplies.
4. Withdrawing from vial:
   • Scrub vial top and injection port of the diluent container with antiseptic solution; allow to dry completely
   • If medication must be reconstituted, inject appropriate amount of diluent and thoroughly mix medication
   • Apply needleless transfer device to vial
   • Attach syringe to needleless transfer device and withdraw medication from vial
   • Label medication syringe with patient's name, medication, dose and rate of infusion, date and time prepared, initials of person preparing medication, beyond-use date, and time
5. Withdrawing from ampoule:
   • Apply filter needle to syringe
   • Break ampoule and withdraw contents
   • Remove filter needle and replace with an appropriate needleless transfer device for medication administration
   • Label syringe with patient's name, medication, dose and rate of infusion, date and time prepared, initials of person preparing medication, beyond-use date, and time
Bibliography


IV (Intravenous) Push Administration

Policy
The drug monograph will be reviewed prior to administration of any IV (intravenous) push medication.

A licensed independent practitioner’s (LIP’s) order is required for all intravenous push therapies.

Procedure
1. Obtain and review LIP’s order.
2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.
3. Explain procedure to patient.
4. Perform hand hygiene.
5. Check medication label for expiration or beyond-use dates; inspect syringe for leaks, cracks, particulate matter, and clarity of medication.
6. Confirm vascular access device (VAD) patency and blood return prior to administration.
7. Administer medication per rate on label.
   • Consult with pharmacist if rate is not specified
8. Flush and lock VAD (see Flushing and Locking).
9. Dispose of used supplies in appropriate receptacles.
11. Document in medication record and patient’s permanent medical record: medication, date, time of administration, route, patient’s tolerance, VAD used, and administering nurse’s initials.

Bibliography


Administration of First Dose

Policy
The first dose of medication will preferably be administered in a controlled setting such as a hospital, with access to emergency medical medications and equipment.

The decision to administer the first dose in care settings outside of the acute care facility will be established by the organization.

Procedure
1. The decision to administer a first dose in a noncontrolled environment will be based on, but not limited to, the following:
   - Patient has no history of allergic, life-threatening reactions to previous drug therapies
   - Patient is alert, cooperative, and able to respond appropriately
   - Contact with other health care providers is available to determine the safety of administering the prescribed drug or medication
   - Contact has been made with the licensed independent practitioner (LIP) to discuss concerns and alternative solutions to first-dose administration in a noncontrolled environment
   - Emergency Medical Services (EMS) are available
   - Location has access to electricity and working telephone
   - There is reasonable advance notice to allow for patient assessment, acquisition and preparation of medication and infusates, and scheduling of appropriate staff

2. When a request to start a first dose in a noncontrolled environment (eg, home) is received:
   - The LIP is requested to order the first dose be administered prior to hospital discharge
   - For the patient who is at home, the registered nurse should notify the LIP to arrange, if possible, for the first dose to be given in a controlled care setting (eg, outpatient setting)
   - If administration of the first dose in a controlled care setting is not possible, an order must be obtained from the LIP for use of anaphylactic medications to be available in the home
   - The nurse must remain with the patient for the entire duration of the infusion of the first dose
   - The LIP must inform the patient regarding the need for and risk of administration of the first dose in the home

3. Obtain and review LIP’s order.
4. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.

5. Explain procedure to patient.


7. Perform hand hygiene.

8. Administer medication as ordered.

9. Discard used supplies in appropriate receptacles.


Bibliography


Central Vascular Access Device Repair

Policy
The nurse will collaborate with the licensed independent practitioner (LIP) regarding the appropriateness of catheter removal versus repair.

The external portion of a central vascular access device (CVAD) may be repaired if an accidental tear, cut, or break occurs.

Supplies
- Mask
- Gloves, sterile
- Clamp
- Repair kit supplied by manufacturer, specific to CVAD

Procedure
1. Identify signs of potential external catheter damage:
   - Pinholes, cuts, and tears to the external portion of the catheter extending from catheter skin junction to hub of catheter
   - Leaking or wet dressing during infusion or flushing
   - Note that signs of potential catheter damage under the skin may include ipsilateral swelling over the chest area and/or complaints of pain, discomfort, or “fullness” upon palpation of the track of a tunneled catheter

2. Seal catheter proximal to damaged portion of catheter immediately if external catheter damage is suspected
   - Seal catheter by closing an existing clamp, adding a clamp, covering the damaged area with an adhesive dressing material, or folding the external segment and securing
   - Label the catheter “Do not use” while awaiting decision for repair

3. Notify LIP immediately.

4. Obtain LIP’s order to repair damaged catheter, if appropriate.
   - An assessment of risks versus benefits of catheter repair should be discussed
   - Factors in decision making include, but are not limited to, patient’s immune status, duration for remaining infusion therapy, or external catheter length
   - When catheter damage under the skin is suspected or external catheter repair is not appropriate, catheter removal and replacement using an exchange procedure or insertion at a new site are appropriate options
5. Explain procedure to patient.
6. Perform hand hygiene.
7. Don mask and sterile gloves.
8. Disinfect external portion of catheter with antiseptic solution; allow to dry completely.
9. Complete repair according to manufacturer’s directions for use.
10. Document in patient’s permanent medical record:
    • LIP notification
    • Repair procedure and outcome
    • Patient tolerance and condition
    • Patient education

**Bibliography**


Culturing for Infusion-Related Infections

Policy
When an infusion-related infection is suspected, cultures are obtained with orders from the licensed independent practitioner (LIP).

Paired blood cultures are used to accurately diagnose catheter-associated bloodstream infection; the sample from a peripheral venipuncture site and from the vascular access device (VAD) are drawn within 10 minutes of each other.

Supplies
- Gloves, nonsterile
- Tourniquet
- Venipuncture equipment for blood sampling
- Culture vials or tubes
- Sterile swabs
- Syringes, 10 mL
- Sterile scissors
- Sterile drape
- Labels
- Transport containers
- Antiseptic solution(s)
- Antiseptic ointment
- Needleless connector
- Dressing material
  - Gauze
  - Transparent semi-permeable membrane (TSM)
- Tape

Preculture Procedure
1. Obtain and review LIP’s order for specific type of culture.
2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.
3. Explain procedure to patient.
4. Assess patient.
5. Perform hand hygiene.
6. Don gloves.
Culture: Drainage at Catheter-Skin Junction

1. If purulent drainage is present at a peripheral or central vascular access device (CVAD) insertion site, culture of drainage should be collected:
   a. Do not cleanse area to be cultured.
   b. Swab purulent drainage with sterile swab.
   c. Uncap culture tube.
   d. Drop swab into culture tube using aseptic technique.
   e. Recap culture tube.

Culture: Vascular Access Device Tip

1. Catheter tips are cultured using a semiquantitative (roll-plate) method or quantitative (sonification) method.

2. For short peripheral catheters, cut entire length of catheter from the catheter hub using sterile scissors.

3. For midline catheters or CVADs, cut a 2-inch segment from catheter tip with sterile scissors.
   a. Cleanse skin at catheter exit site with an antiseptic solution; allow to dry completely prior to catheter removal.
   b. Place sterile drape in close proximity to catheter-skin junction.
   c. Remove catheter, avoiding contact with surrounding skin (see Vascular Access Device Removal).
   d. Uncap culture tube.
   e. Drop catheter segment into culture tube.
   f. Recap culture tube.

Culture: Solution

1. Disinfect injection port of solution container with antiseptic solution; allow to dry completely.

2. Uncap needle with syringe attached.

3. Insert needle into injection port of solution container.

4. Withdraw approximately 5 mL of solution into syringe.

5. Remove needle from solution container.

6. Inject syringe’s contents into culture bottles.

7. Discard syringe in appropriate container.
Blood Culture from a Venipuncture
1. Cleanse intended venipuncture site with antiseptic solution; allow to dry completely.
2. Perform venipuncture (see Phlebotomy).
3. Obtain blood sample and place into culture bottles.

Blood Culture from VAD
1. Change needleless connector prior to obtaining blood sample.
2. Disinfect needleless connector with antiseptic solution; allow to dry completely.
3. Collect blood sample in the volume recommended for culture bottles.
4. Do not discard first draw as this sample is used for culture.
5. Place blood sample into culture bottles.

Postculture Procedure
1. Discard used supplies.
2. Label culture tube prior to leaving patient’s side with:
   • Patient’s name
   • Patient ID number
   • Date and time of specimen collection
   • Contents of culture tube
3. Remove gloves.
4. Perform hand hygiene.
5. Send culture tube and infusate with administration set intact to microbiology lab.
   • Place blood specimen in sealed container for transport
   • Identify container with BIOHAZARD label
7. Obtain and follow up on lab results.
8. If infusate appears contaminated, notify appropriate regulatory agencies.
Bibliography


Sherertz R, Karchmer T, Ohl C, et al. Blood cultures (BC) drawn through valved catheter hubs have a 10-20% positivity rate with the majority being false positives. Paper presented at: Fifth Decennial International Conference on Healthcare-Associated Infections; March 18-22, 2010; Atlanta, GA.

Accessing and Deaccessing an Implanted Vascular Access Port

Policy
Implanted vascular access ports are accessed using only a noncoring needle.

Power injection will be performed only with implanted vascular access ports and noncoring needles identified as power-injection compatible.

When administering an infusion via an implanted port, the noncoring needle is replaced at least every 7 days.

The implanted port should be accessed, flushed, and locked every 4 weeks or at established intervals.

Procedure
Port Access
1. Perform hand hygiene.
2. Verify the patient’s identity using 2 independent identifiers, not including the patient’s room number or bed number.
3. Explain procedure to patient.
4. Assess patient’s pain tolerance and preferences regarding use of local anesthetic prior to port access.
5. Gather supplies.
   - Mask
   - Gloves, sterile
   - Local anesthetic
   - Antiseptic solution
   - Noncoring needle with extension set
   - Needleless connector
   - Preservative-free 0.9% sodium chloride (USP) prefilled syringe
   - Gauze and tape, sterile
   - Transparent semipermeable membrane (TSM) dressing
6. Administer local anesthetic as indicated (see Local Anesthesia).
7. Place patient in a comfortable position with head turned away from implanted port.
8. Assess skin over and around implanted port; palpate port to locate septum.
9. Assemble supplies on sterile field.
10. Don mask and sterile gloves.
11. Cleanse implanted port access site; allow to dry completely (see *Vascular Access Site Care and Dressing Change*).
12. Attach needleless connector to noncoring needle with extension set, and prime set with preservative-free 0.9% sodium chloride (USP).
13. With nondominant hand, palpate and stabilize implanted port.
14. Insert noncoring needle perpendicular to the skin through septum of the port until the needle tip comes in contact with the back of the port.
15. Aspirate for blood to confirm device patency and flush with preservative-free 0.9% sodium chloride (USP).
16. Stabilize noncoring needle with sterile tape; place sterile gauze to support wings of noncoring needle if present, making sure gauze does not obscure needle insertion site.
17. Apply TSM dressing.
18. Initiate infusion therapy as ordered.
19. Discard used supplies in appropriate receptacles.
20. Remove gloves and perform hand hygiene.

**Port Deaccess**
1. Perform hand hygiene.
2. Verify the patient’s identity using 2 independent identifiers, not including the patient’s room number or bed number.
3. Explain procedure to patient.
4. Gather supplies.
   - Gloves, nonsterile
   - Preservative-free 0.9% sodium chloride (USP) prefilled syringe
   - Heparin 100 units/mL 3- to 5-mL prefilled syringe
   - Gauze and tape, sterile
   - Transparent semipermeable membrane (TSM) dressing
5. Apply nonsterile gloves.
6. Flush port with 5-10 mL of preservative-free 0.9% sodium chloride (USP) and lock port with heparin as prescribed (see *Flushing and Locking*).
7. Remove dressing, noting any drainage, redness, or swelling, and discard.
8. Stabilize port using thumb and forefinger of nondominant hand.
9. Grasp needle with dominant hand and remove device, engaging safety mechanism; discard into sharps container.

10. Apply gauze dressing to site if bleeding occurs.

11. Discard used materials in appropriate receptacles.

12. Remove gloves and perform hand hygiene.


**Bibliography**


Phlebotomy

Policy
Only the volume of blood needed for accurate testing will be obtained. Blood conservation methods, such as low-volume blood collection tubes, avoidance of routine testing, use of point-of-care testing methods, and consolidating daily tests with a single blood draw, should be considered to minimize blood loss.

Blood specimens may not be drawn from an infusion administration set or proximal to an existing infusion site.

The nurse should collaborate with the laboratory for technical factors involved in blood specimen collection, including use of appropriate blood collection tubes in the correct sequence and timeliness of dispatch of the specimen to the laboratory.

Supplies
- Gloves, nonsterile
- Tourniquet
- Blood collection tubes
- Blood-tube holder
- Phlebotomy needle
- Flush solutions
- Needleless connector
- Syringe(s), 10 mL
- Labels for tubes
- Transport containers
- Antiseptic solution
- Gauze pads
- Tape

Procedure
Note: Numbers 1-6 apply to all following phlebotomy procedures.

1. Obtain and review licensed independent practitioner’s (LIP’s) order.
2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.
3. Explain procedure to patient.
   - For peripheral venipuncture, assess patient for anxiety about venipuncture and for any history of vasovagal reactions with venipuncture
   - Provide education and reassurance as needed
4. Perform hand hygiene.
5. Gather supplies.
6. Don gloves.

**Direct Venipuncture**
1. Position patient with arm extended from body and, if possible, in a dependent position.
2. Apply tourniquet.
3. Select vein:
   - Select veins on the opposite extremity of a vascular access device (VAD)/running infusion; if necessary, venipuncture may be performed distal to the device/infusion
   - Avoid venipuncture on the side of breast surgery with axillary node dissection, after radiation therapy to that side, with lymphedema; affected extremity after stroke; extremity with/planned arteriovenous (AV) fistula
   - Veins in the antecubital fossa are the best choice for blood specimen collection
4. Cleanse intended venipuncture site with antiseptic; allow to dry completely.
5. Perform venipuncture. Insert needle of blood collection equipment, hold in place, and advance specimen tube. Observe for backflow of blood into tube.
6. Obtain desired amount of blood. If more than 1 tube of blood is needed, change tubes slowly and steadily, taking care not to move needle in cannulated vein and cause patient undue pain or discomfort.
7. Release tourniquet.
8. Remove last tube from blood-tube holder and set aside.
9. Remove needle from vein, activate safety mechanism, apply pressure at site with gauze until hemostasis is achieved.
10. Discard used needle and blood-tube holder into sharps container.

**Phlebotomy via Short Peripheral Catheter**
1. Consider blood sampling through a short peripheral catheter (VAD) for patients who require multiple laboratory tests, are at risk for bleeding, and/or have limited or difficult venous access.
2. Disinfect needleless connector with antiseptic solution; allow to dry completely.
3. Apply tourniquet.
4. Attach syringe to needleless connector and withdraw 1-2 mL of blood and discard.
5. Attach second syringe to needleless connector. Withdraw desired amount of blood.
6. Release tourniquet.
7. Transfer sample to blood tube.
8. Replace needleless connector and flush VAD as ordered (see Flushing and Locking).

Phlebotomy via Central Vascular Access Device (CVAD)
1. Discontinue administration of infusates prior to obtaining blood samples.
2. Disinfect needleless connector with antiseptic solution; allow to dry completely.
3. Obtain discard sample:
   • Attach empty 10 mL syringe and withdraw 4-5 mL of blood —or—
   • Attach blood-tube holder, advance blood collection tube to obtain 4-5 mL of blood

NOTE: If unable to obtain blood return:
   • Have patient change position, cough, move arm above head, or take a deep breath and hold
   • Attempt to flush CVAD with preservative-free 0.9% sodium chloride (USP)
   • Replace blood tube
4. Obtain blood samples as ordered.
5. Transfer blood samples from syringe(s) to appropriate blood specimen tubes, if applicable.
6. Change needleless connector according to manufacturer’s directions for use or organizational policy.
7. Flush CVAD with 10 mL preservative-free sodium chloride (USP) and lock CVAD or resume infusion as ordered (see Flushing and Locking).
Post–Blood Drawing

1. Label blood samples before leaving the patient as established by the organization.

2. Send samples to testing laboratory:
   • Certain specimens may need to be placed on ice during transport; check with laboratory used by the organization
   • Place blood specimen in sealed container for transport
   • Identify container with BIOHAZARD label

3. Discard used supplies in appropriate receptacles.

4. Remove gloves.

5. Perform hand hygiene.


Bibliography


Therapeutic Phlebotomy

Policy
Therapeutic phlebotomy is the removal of a specific volume of blood from a patient for the treatment of a specific condition or disease.

A licensed independent practitioner’s (LIP’s) order is required for therapeutic phlebotomy.

The use of central vascular access devices (CVADs) is not recommended for therapeutic phlebotomy.

In patients who require multiple phlebotomies, the placement of an apheresis catheter may be considered.

Supplies
- Gloves, nonsterile
- Tourniquet
- Phlebotomy pack and tubing
- Catheter insertion
  - Peripheral IV catheter (18-20 gauge acceptable)
  - Antiseptic solutions
  - Local anesthesia, if needed
  - Gauze and tape, sterile

Procedure
1. Obtain and review LIP’s order for therapeutic phlebotomy procedure. Orders must include:
   - Amount of blood to be drawn
   - Frequency of withdrawal
   - Orders may also include:
     - Goal for hematocrit and hemoglobin levels post-phlebotomy
     - Fluid replacement, including type of fluid, rate, route, and amount

2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.

3. Explain procedure to patient.

4. Obtain patient consent.

5. Perform hand hygiene.

6. Gather supplies.

7. Obtain baseline vital signs.
8. Assess the upper extremities for an appropriate venipuncture site (see *Site Assessment and Selection*).

9. Don gloves.

10. Attach phlebotomy tubing to receptacle container. Container should remain below the heart throughout procedure.

11. Insert catheter (see *Peripheral Vascular Access Device Site Preparation and Placement*).

12. Connect phlebotomy tubing to catheter.

13. Slowly open clamp of tubing allowing retrograde blood flow into tubing and receptacle.

14. Collect blood until prescribed quantity is withdrawn, then clamp tubing.

15. Remove catheter. Apply pressure to venipuncture site with gauze until hemostasis is achieved (see *Vascular Access Device Removal*).


17. Observe venipuncture site for bleeding.

18. Discard used supplies in appropriate receptacles.

19. Dispose of collected blood according to organizational policy.

20. Remove gloves and perform hand hygiene.


**Bibliography**


# 9. Nonvascular Access

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Intraspinal Access

Policy
Any medications administered via an intraspinal route (intrathecal, epidural, ventricular reservoir) must be preservative-free and labeled for “intraspinal infusion only.”

A 0.2-micron surfactant-free, particulate-retentive, and air-eliminating filter will be used for the administration of all intraspinal medications.

Intraspinal access devices, administration sets and, if used, infusion pumps should be clearly labeled to differentiate these from other infusion systems.

The use of alcohol or alcohol-containing solutions, or acetone, will be avoided for site preparation prior to device insertion, site care, and disinfection of the catheter hub/needleless connector.

A dressing should cover the intraspinal access insertion site; routine dressing changes for short-term catheters are not recommended due to the risk for dislodgment and infection. For long-term catheters (eg, tunneled or implanted devices), a transparent semipermeable membrane (TSM) dressing is used to cover the site and changed every 7 days in conjunction with site antisepsis. After the first 24 hours postplacement of a ventricular reservoir, the site is usually not covered with a dressing.

Use of chlorhexidine-impregnated dressings may be considered for short-term intraspinal catheters to reduce the risk of central nervous system-associated infection.

Access of, and administration of medications via a ventricular reservoir or an implanted infusion pump are most often performed by a physician or a specially trained registered nurse (RN) if allowed by the individual’s state Board of Nursing Practice Act.

Long-Term External Intraspinal Catheter Site Care and Dressing Change

Procedure
1. Obtain and review licensed independent practitioner's (LIP’s) order.
2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.
3. Explain procedure to patient.
4. Place patient in comfortable position.
5. Perform hand hygiene.
6. Gather supplies.
   - Gloves, nonsterile
   - Gloves, sterile
   - Mask
   - Povidone-iodine solution
   - Antimicrobial dressing (optional)
   - TSM dressing
   - Tape
   - Tape measure, sterile

7. Assemble supplies on sterile field.

8. Don mask and nonsterile gloves, and carefully remove existing dressing and discard.

9. Remove gloves.


11. Don sterile gloves.

12. Observe insertion site for redness, drainage, swelling, or pain.

13. Measure external catheter length with tape measure.

14. Cleanse the skin with povidone-iodine; allow to dry completely.

15. Place antimicrobial dressing around the insertion site, if used.

16. Place TSM dressing over entire area, centering it over the catheter insertion site, anchoring catheter with extra tape on skin as needed.

17. Remove gloves and mask. Discard all used supplies in appropriate receptacles.

18. Perform hand hygiene.

19. Label dressing with date, time, and initials of nurse.


**Implanted Epidural/Intrathecal Port Access and Medication Administration**

**Procedure**

1. Obtain and review LIP’s order.

2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.
3. Explain procedure to patient.

4. Place patient in a comfortable position with head turned away from implanted port.

5. Perform hand hygiene.

6. Gather supplies.
   • Gloves, nonsterile
   • Gloves, sterile
   • Mask
   • Noncoring needle with extension set
   • Povidone-iodine solution
   • Needleless connector
   • Preservative-free 0.9% sodium chloride (USP) prefilled syringe
   • Syringe(s)
   • Gauze (optional)
   • Antimicrobial dressing (optional)
   • TSM dressing
   • Tape

7. Assess skin over and around implanted port; palpate port to locate septum.

8. Assemble supplies on sterile field.

9. Don mask and sterile gloves.

10. Cleanse implanted port access site using povidone-iodine; allow to dry completely.

11. Attach needleless connector to noncoring needle with extension set and prime set with preservative-free 0.9% sodium chloride (USP).

12. With nondominant hand, palpate and stabilize implanted port.

13. Insert noncoring needle perpendicular to the skin, through septum of the port until the needle tip comes in contact with the back of the port.

14. Attach syringe to catheter hub/needleless connector and gently aspirate from the device.
   • Epidural: observe for the absence of cerebral spinal fluid (CSF) or blood. If either is present, do not inject medication. Notify LIP
   • Intrathecal: observe for the presence of CSF. If blood is present, do not inject medication. Notify LIP

15. Place sterile gauze to support wings of noncoring needle if needed, making sure gauze does not obscure needle insertion site.

16. Apply TSM dressing.
17. Administer medication/infusion as ordered (see below, *Medication Administration Via External Intraspinal Catheter*).

18. Discard used supplies in appropriate receptacle(s).

19. Remove gloves.

20. Perform hand hygiene.


**Medication Administration Via External Intraspinal Catheter**

**Procedure**

1. Obtain and review LIP’s order.

2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.

3. Assess patient’s vital signs and neurological status and explain procedure.

4. Place patient in comfortable position.

5. Perform hand hygiene.

6. Gather supplies.
   - Gloves, nonsterile
   - Mask
   - Povidone-iodine solution
   - Prescribed preservative-free medication in syringe or infusion container attached to primed administration set
   - Preservative-free 0.9% sodium chloride (USP), prefilled syringe

7. Don mask and gloves.

8. Disinfect catheter hub or needleless connector using povidone-iodine solution; allow solution to dry completely.

9. Attach syringe to catheter hub/needleless connector and gently aspirate from the device prior to the injection of medication:
   - Epidural: observe for the *absence* of cerebral spinal fluid (CSF) or blood. If either is present, do not inject medication. Notify LIP
   - Intrathecal: observe for the *presence* of CSF. If blood is present, do not inject medication. Notify LIP

10. For a continuous infusion, attach primed administration set and begin infusion via electronic infusion device (EID) as ordered.

11. For an intermittent dose, slowly administer the medication.

12. Discard used supplies in appropriate receptacles.
13. Remove gloves and mask.


**Removal of Intraspinal Access Devices**

1. Only nurses with specialized training may remove intrathecal or epidural catheters.

2. Intrathecal catheters and ventricular reservoirs are considered permanent devices and are not intended to be removed.

**Bibliography**


Continuous Subcutaneous Access

Policy
Continuous subcutaneous access is considered an alternative infusion route for certain medications and solutions (eg, continuous opioid infusion, immune globulin, hydration fluids for short-term treatment of dehydration) in selected patient situations, such as those with limited venous access, those requiring palliative care, and to allow maximum self-care in infusion administration.

The dwell time of the subcutaneous access device is variable, based on fluid volume and the integrity of the site, ranging from every 2 days for patients who receive higher volumes associated with hydration fluids to every 7 days for low-volume medication infusions. The subcutaneous site is rotated when there is evidence of erythema, swelling, leaking of fluid, bruising, bleeding, burning, or pain.

Hyaluronidase may be ordered by the licensed independent practitioner (LIP); it may be administered when initiating a subcutaneous infusion to increase absorption and dispersion of subcutaneously administered medications and solutions.

Supplies
- Gloves, nonsterile
- Antiseptic solution
- Subcutaneous needle or subcutaneous infusion set, 25- to 27-gauge, 1/2-inch
- Transparent semipermeable membrane (TSM) dressing

Procedure
1. Obtain and review LIP’s order.
2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.
3. Explain procedure to patient.
4. Obtain patient consent.
5. Perform hand hygiene.
6. Gather supplies.
7. Don gloves.
8. Identify insertion site:
   - Areas with adequate subcutaneous tissue and intact skin
   - Based on patient’s anticipated mobility and comfort
   - Sites may include: upper arm, subclavicular chest wall, abdomen, upper back, thighs

9. For device site preparation, see *Vascular Access Site Care and Dressing Change*.

10. Select and prepare subcutaneous access device.
    - 25- to 27-gauge, 1/2-inch steel needle or catheter
    - Nonmetal subcutaneous access devices are preferable to metal devices with advantages of improved dwell time

11. Grasp skin between thumb and forefinger, lift up into small mound, and insert device.

12. Aspirate the subcutaneous device to ascertain the absence of blood.
    - If blood is present with aspiration, remove device, discard, and place new device in a different site

13. Attach administration set and initiate infusion therapy as ordered.

14. Apply TSM dressing, label with the date and time of insertion and initials of the nurse inserting the device.

15. Discard used supplies in the appropriate receptacles.

16. Remove gloves and perform hand hygiene.


18. Monitor for signs of complications such as:
    - Bleeding, erythema, swelling, leaking of fluid, bruising, bleeding, burning, or pain
    - Remove device and rotate site if present
Bibliography


Intraosseous Access

Policy
Emergent and nonemergent intraosseous (IO) access is considered when intravenous (IV) access cannot otherwise be obtained and when the patient is at risk of morbidity or even mortality if access is not obtained.

The dwell time of the IO device will be no longer than 24 hours, and a plan established for placement of an appropriate alternative vascular access device.

Pain management during insertion and infusion should be considered, especially in the conscious patient.

Supplies
- Gloves, nonsterile
- IO access device
- IO insertion kit
- Local anesthesia, if ordered
- Antiseptic solution
- Needleless connector
- Preservative-free 0.9% sodium chloride (USP) prefilled syringe(s)
- Transparent semipermeable membrane (TSM) dressing

Procedure
1. Obtain and review licensed independent practitioner’s (LIP’s) order.
2. Verify patient’s identity using 2 independent identifiers, not including patient’s room number or bed number.
3. Explain procedure to patient.
4. Obtain patient consent.
5. Perform hand hygiene.
6. Gather supplies.
7. Don gloves.
8. Identify insertion site.
   - Appropriate sites include proximal humerus, sternum, distal femur, humeral head, radius, ulna, pelvis, clavicle
   - Sites to avoid include previously used IO sites or where previously attempted, fractures at or above site, where bone surgery had previously been performed, presence of infection, evidence of local vascular compromise
• Bone diseases such as osteogenesis imperfecta, osteopetrosis, and severe osteoporosis may be a contraindication, depending on the device

9. Cleanse insertion site with soap and water, if needed.

10. Remove excess hair from the intended insertion site with clippers or scissors, if necessary.

11. Administer local anesthesia if patient is conscious and per LIP order.
  • Subcutaneously at the insertion site (see Local Anesthesia)
  • May also inject into the IO space after access is established and prior to infusion

12. Apply antiseptic solution to access site; allow to dry completely.

13. Stabilize extremity.

14. Follow the manufacturer’s directions for use for device placement.

15. Confirm proper placement of the IO device by assessment of the needle position and flushing with 5-10 mL of 0.9% preservative-free sodium chloride (USP) that should enter by free flow or infuse without resistance.

16. Attach administration set and initiate infusion therapy as ordered.

17. Apply TSM dressing. Label with the date and time of insertion and initials of the nurse inserting the IO device.

18. Discard used supplies in the appropriate receptacles.

19. Remove gloves and perform hand hygiene.


21. Monitor for signs of complications such as:
  • Improper access device placement or dislodgment leading to infiltration or extravasation
  • Access device obstruction
  • Embolization of fat and bony fragments
  • Bone damage
  • Compartment syndrome

22. After IO device removal, inspect site and change dressing until site has epithelialized and drainage has ceased.
Bibliography


Figure 1: Veins of the head and neck.
From Dorland’s Illustrated Medical Dictionary, 30th ed., Plate 5d, p. 2013, © 2003, used with permission from Elsevier.
Figure 2: Principal veins of the body.
Figure 3  Superficial veins of the upper limb.
From Dorland's Illustrated Medical Dictionary; 30th ed., Plate 53; p. 2015, © 2003, used with permission from Elsevier.
Figure 4: Superficial veins of the lower limb.