2016 INS Standards Update

Lisa A. Gorski MS, HHCNS-BC, CRNI®, FAAN
Disclosures

• Speakers Bureau - BD Medical, Access Scientific, Genentech

• Advisory Board Member -- ivWatch
Session Objective

• Describe the methodology for revising the 2016 Infusion Therapy Standards of Practice.
• Identify new standards and major changes in existing standards.
• Discuss findings from the INS Vesicant Task Force.
International Opportunities to Present the INS Standards
Acknowledgement:
2016 Standards Committee

- Chair - Lisa Gorski, MS, RN, HHCNS-BC, CRNI®, FAAN
- Lynn Hadaway, Med, RN-BC, CRNI®
- Mary E. Hagle, PhD, RN-BC, FAAN
- Mary McGoldrick, MS, RN, CRNI®
- Marsha Orr, MS, RN
- Darcy Doellman, MSN, RN, CRNI®, VA-BC

CITATION FOR STANDARDS:
Gorski, LA, Hadaway, L, Hagle, M, McGoldrick, M, Orr, M, Doellman, D.
INS Mission & History of INS Standards

• Mission
  • Develop and disseminate standards of practice
  • Provide professional development opportunities and education
  • Advance best practice through synthesis and research
  • Support professional certification
  • Advocate for the public
Foreword

• “Whether the purpose lies in informing patient care, legal proceedings, or personal edification and growth, no document is more versatile, time-tested, or valuable in the field of infusion practice.”

• “As a physician researcher dedicated to improving the safety of patients who require vascular access and infusion-based therapies, the Standards has informed the work that I do, the questions I ask, and the clinical care I provide. Quite simply put, there is nothing else like it.”

Vineet Chopra, MD, MSC
Ann Arbor VA Medical Center &
University of Michigan Health System
Additional Resource

- *Policies and Procedures for Infusion Therapy*
- *Translate the Standards into clinical procedures*
‘Infusion therapy does not “belong” to one group of clinicians, but it is the responsibility of any clinician who is involved in the practice.’

Standard 3. Scope of Practice

• Clear definition of roles, responsibility, and accountability for each clinician in accordance with regulations, organizational policy
• Collaboration among the healthcare team
• Address nurses, unlicensed assistive personnel, radiologic/respiratory technician/technologist/therapist, paramedics
2016 Table of Contents

64 Standards – divided into 9 sections
1: Infusion Therapy Practice
2: Patient & Clinician Safety
3: Infection Prevention & Control
4: Infusion Equipment
5: Vascular Access Device (VAD) Selection & Placement
6: VAD Management
7: VAD-Related Complications
8: Other Infusion Devices
9: Infusion Therapies
Appendices

• Infusion Team Definition
• New illustrations
• Glossary greatly expanded
  • Definitional information from previous document moved to glossary
### INFUSION THERAPY STANDARDS OF PRACTICE CROSSWALK: 2011/2016

<table>
<thead>
<tr>
<th>2011</th>
<th>2016</th>
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<tbody>
<tr>
<td><strong>NURSING PRACTICE</strong></td>
<td><strong>Renamed:</strong></td>
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<tr>
<td>1. Practice Setting</td>
<td>1. Renamed: Patient Care—revised to include standards, ethics, and policies and procedures</td>
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<tr>
<td>2. Neonatal and Pediatric Patients</td>
<td>2. Renamed: Special Patient Populations—includes neonatal, pediatric, pregnant, and older adult patients</td>
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<tr>
<td>3. Older Adult Patients</td>
<td>Deleted as separate standard and incorporated in Standard #2</td>
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<td>4. Ethics</td>
<td>Deleted as separate standard and incorporated into Standard #1</td>
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<td>5. Scope of Practice</td>
<td>3. Scope of Practice</td>
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<td>4. NEW STANDARD: Infusion Team</td>
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<td>6. Competency and Competency Validation</td>
<td>5. Competency Assessment and Validation</td>
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<td>7. Quality Improvement</td>
<td>6. Quality Improvement</td>
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<tr>
<td>8. Research and Evidence-Based Practice</td>
<td>7. Evidence-Based Practice and Research</td>
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<tr>
<td>9. Policies, Procedures, and/or Practice Guidelines</td>
<td>Deleted as separate standard and incorporated into Standard #1</td>
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<td>8. Patient Education</td>
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<td>9. Informed Consent</td>
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<td>10. Documentation in the Medical Record</td>
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<tr>
<td><strong>PATIENT CARE</strong></td>
<td><strong>Renamed:</strong></td>
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<tr>
<td>10. Orders for the Initiation and Management of Infusion Therapy</td>
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<tr>
<td>11. Patient Education</td>
<td>Moved to Section One—Standard #8</td>
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<td>12. Informed Consent</td>
<td>Moved to Section One—Standard #9</td>
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<td>13. Plan of Care</td>
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<td>11. Adverse and Serious Adverse Events</td>
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<td>12. Product Evaluation, Integrity, and Defect Reporting</td>
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<td>13. Medication Verification</td>
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<td>14. Latex Sensitivity or Allergy</td>
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<td>15. Hazardous Drugs and Waste</td>
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Crosswalk document is available on the INS Web site at the INS Learning Center
Format of the Standards – Not changed but less repetition

- **Standards and Practice Criteria**
- **Standards**
  - Expectations of practice applicable to infusion therapy in all settings
  - Not rated
“Section” Standards

• Apply to all Standards in the section – ↓ repetition
• Section Standards included in Sections 4-9
• Example Section 7: VAD-Related Complications
  • “To ensure patient safety, the clinician is competent to recognize s/s of VAD-related complications during insertion, management, and removal, and appropriately intervene.”
  • “Prevention, assessment and management …are addressed in organizational policies, procedures, and/or practice guidelines”

Format of the Standards

**Practice Criteria**

- Provide specific guidance in the implementation of the corresponding Standard
- Each Practice Criterion is supported by evidence
- Each Criterion is rated as reflecting the strength of the body of evidence
- Reflects the body of evidence available and retrievable at the time of review
- Rating Scale: I, IA/P, II-V, Regulatory
- References for each Practice Criterion are listed
<table>
<thead>
<tr>
<th>Strength of the Body of Evidence</th>
<th>Evidence Description*</th>
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<tbody>
<tr>
<td>I</td>
<td>Meta-analysis, systematic literature review, guideline based on randomized controlled trials (RCTs), or at least 3 well-designed RCTs.</td>
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<tr>
<td>IA/P</td>
<td>Evidence from anatomy, physiology, and pathophysiology references as understood at the time of writing.</td>
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<tr>
<td>II</td>
<td>Two well-designed RCTs, 2 or more multicenter, well-designed clinical trials without randomization, or systematic literature review of varied prospective study designs.</td>
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<tr>
<td>III</td>
<td>One well-designed RCT, several well-designed clinical trials without randomization, or several studies with quasi-experimental designs focused on the same question. Includes 2 or more well-designed laboratory studies.</td>
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<tr>
<td>IV</td>
<td>Well-designed quasi-experimental study, case-control study, cohort study, correlational study, time series study, systematic literature review of descriptive and qualitative studies, or narrative literature review, psychometric study. Includes 1 well-designed laboratory study.</td>
</tr>
<tr>
<td>V</td>
<td>Clinical article, clinical/professional book, consensus report, case report, guideline based on consensus, descriptive study, well-designed quality improvement project, theoretical basis, recommendations by accrediting bodies and professional organizations, or manufacturer directions for use for products or services. Includes standard of practice that is generally accepted but does not have a research basis (eg, patient identification). May also be noted as Committee Consensus, although rarely used.</td>
</tr>
<tr>
<td>Regulatory</td>
<td>Regulatory regulations and other criteria set by agencies with the ability to impose consequences, such as the AHRQ, Centers for Medicare &amp; Medicaid Services (CMS), Occupational Safety and...</td>
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</table>
Evidence -- The Evolving Science of Infusion Therapy

• INS Standards 2011
  • Level I (highest) evidence – 3.8% of rankings
  • Level V evidence – 67%

• INS Standards 2016
  • Level I (highest) evidence – 5.8% of rankings
  • Level V evidence – 46%

• 350 more references
A brief look at some new and changed 2016 Standards

NOTE: Information provided includes *selected excerpts* of Standards and Practice Criteria, not the complete content from any Standard.
Standard 4. Infusion Team

• Scope of service to meet patient and organization needs
• VAD insertion and management assigned to individuals/teams with infusion therapy education, training, and validated competency
• Peripheral catheter insertion by team = increased insertion success, decreased hospital acquired BSI, local infection, occlusions, and accidental removals
• Team managing VADs decrease BSI and related costs, phlebitis and infiltration, and increase patient satisfaction
• More studies needed to expand and increase level of evidence ranking
Standard 5. Competency Assessment & Validation

• Standard
  • As a method of public protection to ensure patient safety, the clinician is competent in the safe delivery of infusion therapy and VAD insertion and/or management within his/her scope of practice.
  • Clinician responsible and accountable for attaining and maintaining competence
  • Competency assessment and validation is performed initially and on an ongoing basis

Standard 5. Competency Assessment & Validation

• Practice Criteria

  • Competence goes “beyond psychomotor skills to include application of knowledge, critical thinking skills, decision making” (IV)
  
  • Use a combination of different measurement techniques such as self-assessment (promote self-efficacy, confidence), written tests (knowledge), clinical scenarios (critical thinking), psychomotor skills (simulation, observation in work environment preferred for invasive infusion procedures) (IV)
  
  • Qualifications for role of competency assessor -- the person validating the specific skill should be competent with the skill. (IV)

Standard 22. Vascular Visualization

• Visible light devices for transillumination
  • Cold light source needed

• Near-infrared light devices
  • More informed decisions about peripheral veins, bifurcation, tortuosity

• Ultrasound
  • Peripheral sites – requires longer catheters
  • Addresses CVADs
  • Dynamic or “real-time” use is recommended
  • Sterile TSM dressing (peripheral sites), sheath cover and gel
Standard 23. CVAD Tip Location

- **Standard**
  - Tip location of a CVAD is determined radiographically or by other imaging technologies prior to initiation of infusion therapy or when clinical signs and symptoms suggest tip malposition.
  - The CVAD tip location with the greatest safety profile in adults and children is the cavoatrial junction (CAJ).

- **Practice Criteria**
  - ECG methods – “real time” identification of placement (II)
  - Chest radiograph required in absence of technology used during the procedure (II)
  - Position tip in lower superior vena cava at or near CAJ (II)
  - Lower body insertion sites – inferior vena cava above level of diaphragm (IV)

Standard 26. VAD Planning
– A critically important Standard

Standards:

• “.. appropriate VAD is selected to accommodate the patient’s vascular access needs based on the prescribed therapy or treatment regimen; anticipated duration of therapy; vascular characteristics; and patient’s age, comorbidities, history of infusion therapy, preference for VAD location, and ability and resources available to care for the device”

• VAD selection occurs as a collaborative process among the interprofessional team, the patient, and the patient’s caregivers

• Fewest number of lumens, least invasive, smallest outer diameter
VAD Planning translated into the Policy/Procedure Manual

“..overarching goal …choose the least invasive VAD that has the greatest likelihood of reaching end of the planned infusion therapy with the fewest number of replacements and the lowest rate of complications.”

“Selection of the most appropriate VAD, and site of placement, are critical decisions that impact the clinical outcome as well as the patient experience and satisfaction with care.”

“..a complex decision that requires critical thinking and analysis; the decision is generally not based on a single factor, such as the drug or solution category of vesicant or irritant.”

After performing a literature review, unable to substantiate 2011 Standards recommendation that “therapies not appropriate for short peripheral catheters/midlines include infusates with a pH of < 5 or > 9”

New Work from the INS Vesicant Task Force: An Evidence-Based List of Noncytotoxic Vesicants

• “The first step in reducing the risk of extravasation is to identify and recognize drugs and solutions that are associated with tissue damage when the solution escapes from the vascular pathway.”

Lisa A. Gorski (Task Force Chair), Marc Stranz, Lynda Cook, James Joseph, Kathy Kokotis, Pam Sabatino-Holmes, Lori Van Gosen
INS Vesicant Task Force: Noncytoxic Vesicants

**RED LIST:**
Well-recognized vesicants with multiple citations and reports of tissue damage upon extravasation

<table>
<thead>
<tr>
<th>Vesicant</th>
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<tbody>
<tr>
<td>Calcium chloride</td>
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<tr>
<td>Calcium gluconate</td>
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<tr>
<td>Contrast media - nonionic</td>
</tr>
<tr>
<td>Dextrose Concentration ≥12.5%</td>
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<tr>
<td>Dobutamine</td>
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<tr>
<td>Dopamine</td>
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<tr>
<td>Epinephrine</td>
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<tr>
<td>Norepinephrine</td>
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<tr>
<td>Parenteral nutrition solutions exceeding 900mOsm/L</td>
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<tr>
<td>Phenylephrine</td>
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<tr>
<td>Phenytoin</td>
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<tr>
<td>Promethazine</td>
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<tr>
<td>Sodium bicarbonate</td>
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<tr>
<td>Sodium chloride ≥3%</td>
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<tr>
<td>Vasopressin</td>
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INS Vesicant Task Force: Noncytotoxic Vesicants

- **YELLOW LIST:** Vesicants associated with fewer published reports of extravasation; published drug information and infusate characteristics indicate caution and potential for tissue damage.

<table>
<thead>
<tr>
<th>Vesicants</th>
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<tbody>
<tr>
<td>Acyclovir</td>
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<tr>
<td>Amiodarone</td>
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<tr>
<td>Arginine</td>
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<tr>
<td>Dextrose Concentration ≥10%-12.5%</td>
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<tr>
<td>Mannitol ≥20%</td>
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<tr>
<td>Nafcillin</td>
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<tr>
<td>Pentamidine</td>
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<tr>
<td>Pentobarbital Sodium</td>
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<tr>
<td>Phenobarbital Sodium</td>
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<tr>
<td>Potassium ≥60mEq/L</td>
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<tr>
<td>Vancomycin Hydrochloride</td>
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Standard 27. Site Selection

- Use site most likely to last the full length of the prescribed therapy, using the forearm to increase dwell time, decrease pain during dwell time, promote self-care, and prevent accidental removal and occlusions. Consider veins found on the dorsal and ventral surfaces of the upper extremities, including the metacarpal, cephalic, basilic, and median veins. (IV)
- Do not use lower extremity veins (adults)
- Discuss arm preference for VAD site selection, including a recommendation to use sites in the nondominant arm. (V)
- Areas to avoid: inner aspect of wrist, areas of flexion/pain and sites distal to these areas, compromised veins, areas of previous infiltration or extravasation
- Ultrasound for short peripheral catheter placement in adult and pediatric patients with difficult venous access and/or after failed venipuncture attempts
Standard 33. Vascular Access Site Preparation & Device Placement

• Make no more than 2 attempts at short peripheral catheter placement per clinician; limit total attempts to no more than 4.

• “Multiple unsuccessful attempts cause patient pain, delay treatment, limit future vascular access, increase cost, and increase risk for complications. Patients with difficult vascular access require a careful assessment of VAD needs and collaboration with the health care team to discuss appropriate options.”
Standard 33. Vascular Access Site Preparation and Device Placement

- Short peripheral catheters
- **Committee Consensus:** Consider increased attention to aseptic technique, including strict attention to skin antisepsis and use of sterile gloves….lack of evidence comparing BSI rates with or without use of sterile gloves, longer dwell times have raised concerns regarding risk for BSI ..furthermore contamination of nonsterile gloves is documented”
34. Needleless Connectors

- Practice Criteria
  - Need for NC between the VAD hub and administration set used for continuous infusions is unknown. Primary purpose of NCs is eliminating needles and risk for needlestick injury with intermittent infusions
  - NCs are potential sites for intraluminal microbial contamination – need for careful adherence to infection prevention practices
  - Vigorous mechanical scrub prior to each access using 70% alcohol, iodophors, >0.5% chlorhexidine in alcohol
  - Duration of scrub time dependent on design of NC and properties of disinfectant - range 5-60 seconds – more research needed

Standard 34. Needleless Connectors

• Passive disinfection cap recommendations
  • **Committee Consensus:** After removal, multiple accesses of the VAD may be required to administer a medication (eg, flush syringes and administration sets) and require additional disinfection before each entry. Scrubbing time, technique, and agents for disinfection of the needleless connector between subsequent connections is unknown due to a lack of research. **Consider using a vigorous 5- to 15-second scrub time with each subsequent entry into the VAD, depending upon the needleless connector design.**
Standard 35.
Filtration

• Practice Criteria

  • Evolving evidence documenting the effect of particulate matter (e.g., rubber, glass, latex) on capillary endothelium and the effect of microbubbles of air that may cause cerebral and pulmonary ischemia; use of particulate-retentive and air-eliminating filters can prevent potential damage from air/particulates (V)
  
  • Consider fluid and medication filtration in critically ill patients; filter use was associated with a significant reduction in overall complications for patients in pediatric intensive care units including a significant reduction in systemic inflammatory response syndrome (SIRS); a 0.2 micron filter was used for crystalline solutions and a 1.2-micron filter used for lipid-containing admixtures. (III)

Standard 37. VAD Stabilization

• Stabilize and secure vascular access devices (VADs) to prevent VAD complications and unintentional loss of access.

• Practice Criteria
  • Consider use of an engineered stabilization device (ESD)
  • **Glossary Term: Engineered Stabilization Device.** A device or system placed subcutaneously or topically; specifically designed and engineered to control movement at the catheter hub.
  • Movement at the catheter hub increases the risk for phlebitis, infiltration, and risk for accidental dislodgement
  • Tape and sutures are not an effective alternative to an ESD
What Not to Do

- Practice Criteria
  - Do not use rolled bandages, with or without elastic properties, to secure any type of VAD
  - They do not adequately secure the VAD, can obscure signs and symptoms of complications, and can impair circulation or the flow of infusion.
  - Presence of skin disorders that contradict the use of medical adhesives (i.e., pediatric epidermolysis bullosa; toxic epidermal necrolysis) may necessitate the use of tubular gauze mesh rather than adhesive engineered stabilization devices (ESD).
Standard 40. Flushing and Locking

- **Flush** with normal saline, aspirate for blood return, clear medication from lumen, prevent contact between incompatible solutions
  - Minimum volume = twice internal volume of catheter system
  - Larger volume may be needed
- **Lock** solutions
  - Peripheral catheters – normal saline in adults; heparin 0.5 to 10 units per mL OR normal saline for neonates and pediatrics
  - Midline catheters – insufficient evidence for recommendation
  - CVADs – heparin 10 units per mL OR normal saline
  - Volume = internal volume of catheter system plus 20%
Standard 41. VAD Assessment, Care, Dressing Changes

• **PRACTICE CRITERIA:**
  • Assess VAD catheter-sin junctions site and surrounding area for redness, tenderness, swelling, and drainage by visual inspection and palpation through the intact dressing and through patient reports about any discomfort including pain, paresthesias, numbness, or tingling.
  • CVAD and midline catheter sites at least once per day.
  • Routinely assess short peripheral catheter sites
    • At least every 4 hours
    • Every 1 to 2 hours for patients who are critically ill/sedated or have cognitive deficits
    • Hourly for neonatal/pediatric patients
    • Vesicant infusions – more often
Standard 41. VAD Assessment, Care, Dressing Changes

• Use of chlorhexidine dressings
  • Use chlorhexidine-impregnated dressings over CVADs to reduce infection risk when the extraluminal route is the primary source of infection. Even when organizations show a low baseline central line-associated bloodstream infection (CLABSI) rate, further reduction in CLABSI rate has been demonstrated with use of chlorhexidine-impregnated dressings.
  • Consider use of chlorhexidine dressings with peripheral arterial catheters.
  • Use with caution – premature neonates, those with fragile skin or complex skin pathologies due to risk for contact dermatitis and pressure necrosis
Standard 44. VAD Removal

- Peripheral and nontunneled CVAD need assessed daily
- Removed for unresolved complications, discontinuation of infusion therapy, no longer necessary for plan of care
- Peripheral catheter – remove if not used for 24 hours
- List of clinical indications for removal of peripheral and midline catheters
Standard 44. VAD Removal
--Focus on Short Peripheral Catheters

• Critical issues to consider when changing policy from timed catheter removal (i.e. every 96 hours) to clinically indicated short peripheral catheter removal
  • Appropriate site selection
  • Appropriate device selection
  • Attention to conditions under which catheter placed --- ASEPTIC technique is critical
  • Stabilization
  • Maintenance of intact dressing
Standard 47. Nerve Injuries

• Standard
  • During peripheral venipuncture and catheter dwell time, reports of paresthesia-type pain require immediate removal of the VAD.
  • During the insertion or dwell of CVADs, clinicians will maintain a high index of suspicion for nerve injuries when the patient complains of respiratory difficulty or unusual presentations of pain or discomfort.
Standard 47. Nerve Injuries

• Practice Criteria
  • Selecting specific peripheral venous and arterial puncture sites for the purpose of avoiding nerves is not possible; however, common sites have a greater risk of nerve injury. Venipuncture sites with the greatest risk include:
    • Distal sensory branches of the radial and ulnar nerves for sites in the dorsal hand.
    • Superficial radial nerve at the cephalic vein of the radial wrist.
    • Median nerve on the volar aspects of the wrist.
    • Median and anterior interosseous nerve at or above the antecubital fossa.
    • Lateral and medial antebrachial nerves for the antecubital fossa.
    • Brachial plexus nerve for subclavian and jugular sites.

Standard 47. Nerve Injuries

• Practice Criteria
  • Review the patient’s medication list for systemic anticoagulant medication(s) prior to making a puncture in a vein or artery.
  • Do not use subcutaneous probing techniques or multiple passes of the needle or catheter when performing any puncture procedure as this increases risk of nerve damage. (V)
