Reducing Infection Risks Related to Vascular Access Devices: A Focus on Personnel Competency and Training

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Speaker Disclosure

- Lynn Hadaway has accepted an honorarium from Baxter Healthcare Corporation. She has also worked as a consultant for Baxter over the past five years.
- The content of this presentation is solely that of the presenter and is not affiliated with any facility or institution or Baxter Healthcare Corporation.
About Our Speaker

Lynn Hadaway, M.Ed., RN, BC, CRNI

- Lynn has more than 35 years experience in infusion nursing and adult education.
- She holds two national certifications: infusion nursing from the Infusion Nurses Certification Corporation and nursing professional development from the American Nurses Credentialing Corporation. She also holds a Masters in Education from the University of Georgia.
- Lynn is the author of numerous publications, including those related to infusion and vascular access and complication management.
- She has served as director-at-large and president of the Association for Vascular Access (AVA); served as the president of the Southeastern Chapter of INS twice; and serves on the current INS Standards of Practice Committee. She is president of Lynn Hadaway Associates, Inc., an education and consulting company which was established in May 1996.

Objectives

- Explain the definitions, purpose, and accountability for competency and competency validation.
- Categorize the process of initial and ongoing competency validation related to vascular access devices.
- Recognize the organizations/agencies that address competency standards and guidelines.
Competency of Healthcare Personnel

- Why is this so important?
  - Patient Safety!!
  - Public protection from unqualified staff
  - Major component of regulatory requirements for:
    - Each individual
    - Each healthcare organization

Competence

The capability of the nurse to apply knowledge, critical thinking, interpersonal decision making, and psychomotor skills to the performance of infusion therapy: maintenance of the required knowledge, skills and attitudes to provide safe, competent care from the time of initial licensure.¹
Competency

- An integration of behaviors in the varied circumstance of the work environment demonstrating the individual’s ability to perform the desired job-related activities and tasks.¹
- Responsibility of the individual for their entire career
- Requires:
  - Lifelong learning
  - Self-reflection
  - Professional ethics

Competency

- Documented in a professional portfolio²
  - Reflects personal development throughout your career
  - Emphasizes knowledge and skills learned
  - Includes evidence of clinical competencies
  - Serves as a marketing tool
- Include all career-related documents
  - Personal mission statement
  - Continuing education certificates
  - Awards or recognitions
  - Published articles
  - Letters of commendation or recognition

**Competency-Based Education**

- Educational design that emphasizes what the individual should be able to do or perform
- Focuses on DOING, rather than KNOWING\(^3\)
- Examples from online course, *Peripheral IV Therapy in Adults*, from Lynn Hadaway Associates, Inc.
  - Competency statements based on nursing process
  - Performance criteria are the learning objectives
  - Competency Skill Checklist includes the same statements

**Competency Validation**

- The process of reviewing and documenting the individual’s demonstrated ability to perform a job, role, specific tasks, or other patient care activities.\(^1\)
- Responsibility of the employer
- Documents individual’s knowledge, skills, behaviors and ability to perform the assigned job
**Competency Validation**

When is this assessment or validation performed?
- At employment
- After orientation to the organization
- On an ongoing periodic basis
- When scope of practice changes
- With introduction of new equipment or technology

**Competency Validation Process**

- Dynamic process, NOT static¹
  - Dynamic – vigorous, purposeful, active, changing
  - Static – motionless, not needing to be refreshed
- Process changes as the organization changes
  - Should be based on clinical outcomes¹
  - Component of the Quality Improvement Process
- A continual process occurring along a continuum⁴

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⁴ Joint Commission Resources. Assessing Hospital Staff Competence. 2nd ed. 2007;4.
**Competency Validation Process**

- Required in this process:
  - Annual written tests
  - Annual requirement to perform a specific procedure on an anatomical model
- Not Required in this process:
  - Performance of any procedure at any time on a healthy volunteer\(^1\)

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**Initial Competency for Infusion Therapy**

- What type of individual is involved?
- Tasks within the legal scope of practice for each group?
- Tasks considered to be Core Competencies for each?
  - Nursing Assistive Personnel
  - Medical Assistants
  - Licensed Practical/Vocational Nurses
  - Registered Nurses
  - Infusion Nurse Specialists
  - Advanced Practice Nurses
  - Respiratory Therapists
  - Radiology Technologists
Initial Competency

- New employee
  - Competency-based orientation\(^5\)
    - Basic core skills
      - Self-assessment checklist
      - Written components for medication administration, calculations and intravenous therapy
    - Clinical reasoning assessed by simulations
    - Communications with patient, family, interdisciplinary, and peers
      - Assessed by simulations
    - Work with a preceptor based upon an action plan
    - Improved self-esteem, self-awareness of knowledge, and identification of learning needs

Initial Competency – New Employee

- Focus on Specific Tasks for VAD Infection Reduction
  - Hand hygiene for all infusion related tasks
  - Extraluminal risks
    - Skin antisepsis before venipuncture
      - Agent(s) and application techniques
      - Aseptic non-touch techniques
    - VAD stabilization or securement
      - Device, application and removal
    - VAD dressings
      - Transparent Semi-permeable Membrane (TSM) vs gauze
      - Antiseptic and/or coagulant-impregnated dressings

Initial Competency – New Employee

- Focus on Specific Tasks for VAD Infection Reduction
  - Intraluminal risks
    - Needleless connectors
      - Scrubbing
      - Flushing, clamping sequence
    - IV administration set management
      - Continuous with or without piggyback or secondary sets
      - Intermittent
      - Solution-specific sets
  - Flushing and locking
    - Specific solutions for each
    - Single dose containers

Initial Competency

- Expansion of current scope of practice
  - Short peripheral catheter insertion
  - PICC insertion
  - Other percutaneous CVAD insertion
  - Surgically inserted CVAD

- What is the individual’s clinical experience or background?
  - Does it support the individual’s ability to expand scope of practice?
    - PICC insertion requires solid venipuncture skills, CVAD care and complication management
Initial Competency

- PICC Insertion
  - Continuing education
    - Anatomy, physiology, indication and contraindications
    - Infection prevention
    - Technology, Insertion methods and specific techniques
    - Routine nursing care
    - Complication prevention, diagnosis, and management
  - Period of supervised clinical experience
  - Employer decision about
    - What is a successful insertion
    - How many successful insertions must be performed under supervision

Initial Competency – New Technology

- Applies to all staff using the new device
- PICC insertion with ECG tip confirmation
  - Identifying a P wave on ECG
  - Assessing cardiac history pre-insertion
- Changing products
  - Needleless connectors
    - Flushing, clamping sequence requires knowledge of how the device functions-negative, positive or neutral
  - Stabilization devices
  - Catheter dressings
- Applies to all staff using the new device
Initial Competency
New Policies & Procedures

- Drawing blood cultures from VAD
  - When and how
  - Removing used needleless connector

- Managing Infiltration and Extravasation
  - Signs and symptoms to diagnose ASAP
  - New interventions based on signs and symptoms
    - What drugs require cold versus heat application?
    - What antidotes are used for which drugs?
    - When is a surgical consultation required?

Ongoing Competency
Clinical Outcomes

- Identify specific roles and work settings
- Begin at the END
  - What are the clinical outcomes with VADs in each department?
    - Infection
      - CRBSI or CLABSI?
      - Suppurative thrombophlebitis
      - Cellulitis at venipuncture sites
    - Phlebitis/thrombophlebitis
      - Superficial vein or deep vein?
    - With what types of VADs?
Ongoing Competency Clinical Outcomes

- What are the clinical outcomes with VADs in each department?
  - Infiltration
  - Extravasation
  - Nerve injuries associated with VAD
  - CVAD lumen occlusion
  - CVAD tip malposition

Ongoing Competency Clinical Outcomes

- Infusion therapy clinical outcomes
  - Medication errors
    - Prescribing
    - Transcribing
    - Dispensing
    - Administering
  - Infusion pump programming errors
    - Bypassing drug libraries
  - Blood or blood component errors
  - Parenteral nutrition errors
Ongoing Competency Clinical Outcomes

- Age-related errors
  - Neonates
  - Pediatrics
  - Geriatrics

- Culturally-related errors
  - Ethnic, racial minorities now about 1/3 of US population, expected to be more than half by 2050
  - Language and translation
  - Cultural beliefs

Causes of these outcomes
- Lack of knowledge?
- Lack of skill?
- Lack of performance?
- Lack of time?
- Under-staffing?

What outcomes can be improved by improving education and competency assessment?
- Plan for staff development, specific training
**Internal Data Sources**

- Outcome data from medical records
- Unusual Occurrence or Incident Reports
- Sentinel Events
  - An unexpected occurrence involving death, serious physical or psychological injury; serious injury specifically includes loss of limb or function
- Changing patient populations
- Patient satisfaction data

**Methods for Competency Validation**

- Priorities
  - High risk
  - Low frequency
  - Problem prone
- Frequency is based on the level of risk
  - High-risk, low-frequency may require assessment every 3-6 months
  - Others may only require assessment every 2 years
- What are the problems that need addressing?
Methods for Competency Validation

- Matching the method to the specific competency
  - Knowledge acquisition
    - Written test
  - Critical thinking
    - Clinical scenarios
  - Psychomotor skills
    - Observation in a skills lab
    - Observation in the work setting – the preferred method!!

- Match the method to the specific competency
- Knowledge acquisition
  - Written test for
    - Math calculations
    - Medications
    - Signs and symptoms for a specific condition, e.g., hypoglycemia
Methods for Competency Validation

- Match the method to the specific competency
- Critical thinking skills
  - Clinical scenarios
    - Case studies with required actions to be identified
    - Reflective thinking on what the individual should DO in a specific situation
    - Reflective thinking on what went right and/or wrong after a specific event

Methods for Competency Validation

- Simulation-based educational intervention for CVAD insertion
  - Partial-task trainers – commercially available, homemade, or animal models
  - Standardized patients
  - Full body task trainers
  - High-fidelity mannequins
  - Virtual reality
  - Computer software

Methods for Competency Validation

- Meta-analysis of 20 studies using simulation based training
  - Positive impact on learner knowledge, confidence, satisfaction
  - Patient impact decreased
    - Number of needle passes
    - Risk of pneumothorax
    - Arterial punctures: No reduction in catheter-related infection risk
- Simulation ranked as “most desirable method” for assessing competency with procedural skills

Methods for Competency Validation

- The Real Work World – the Best Place?
  - Observation of actual performance
  - Allows for assessment of individual’s ability to “put it all together”
    - Patient assessment
    - Actual task performance
    - Patient interaction, education
    - Clean up – sharps, blood exposure prevention
    - Documentation
Methods for Competency Validation

- Who is the Validator or Assessor?
  - Manager
  - Preceptor
  - Staff development instructor

- For managers, a distinct imbalance of power can exist⁹
  - Empowerment for professional growth and development
  - Also could manipulate, coerce or force employees

- Competency validation should be fair, balanced and transparent⁹

Methods for Competency Validation

- Competency Validation Checklist

- 2 recent events emphasize importance of checklists
  - ‘Miracle on the Hudson’, result of teamwork and adherence to procedural checklist
  - Publication of The Checklist Manifesto: How to Get Things Right, by Dr. Atul Gawande⁸

- Direct observation with a validated checklist
  - Valid, acceptable, reliable, accurate, and sensitive measurement to quantify learning and performance⁸
  - Science for validation is currently emerging
  - 12 step list for creating valid checklist

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State Boards
- Nursing
- Medicine
- Other
Establishes the legal scope of practice for each professional

Organizations

- Specific Competency Assessment Information and Tools
  - Joint Commission
- Professional Organizations
  - Infusion Nurses Society
  - Oncology Nurses Society
**Organizations**

- Emphasizing Education
  - Society for Healthcare Epidemiology of America (SHEA)
  - Association for Professionals in Infection Control and Epidemiology (APIC)
  - Centers for Disease Control and Prevention
  - Association for Vascular Access

**References**


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