**EP14 – Resources, such as professional literature, are readily available to support decision-making in autonomous nursing practice.**

Provide two examples, with supporting evidence, of how resources are used to support evidence-based clinical decision making in autonomous nursing practice.

**Example 1:** Resource Utilization to Change Practice for Peripheral Intravenous Catheter Management

The Research, Review and Recommendation (R3) Committee is a subcommittee of the PNSO Clinical Practice Committee. The primary function of the committee is to review current evidence and make practice recommendations as appropriate. In 2014, the committee is co-chaired by Barbara Trotter, BSN, RN, and David Strider, DNP, RN, ACNP.

In March of 2014, the current standard of practice at UVA Health System was to rotate peripheral intravenous (PIV) catheter sites at least every 96 hours to prevent complications. For some patients, the site was changed sooner due to infiltration, clotting or dislodgement. However, for others, the site was changed within 96 hours. The site rotation occurred within 96 hours, even if the catheter was patent, clean, dry and intact.

At the March 26, 2014, R3 Committee meeting, the committee discussed concerns about the practice of "sticking" patients to rotate the PIV site when no complications were identified. The R3 Committee members turned to the Infusion Nurses Society's (INS) 2011 Infusion Standards of Practice in search of the evidence to define practice. These standards of practice are available to clinical nurses throughout UVA Health System through the Health Sciences Library online system. The manual is also available in hard copy through the PNSO Nursing Governance Office.

The R3 Committee reviewed the INS Standard 44 on Vascular Access Device Removal, Practice Criteria for Short Peripheral Catheters. This standard provided Level I evidence for a practice change, with ten references to support the recommendation:

"The nurse should consider replacement of the short peripheral catheter when clinically indicated and when infusion treatment does not include peripheral parenteral nutrition. The decision to replace the short peripheral catheter should be based on assessment of the patient's condition; access site; skin and vein integrity; length and type of prescribed therapy; venue of care; integrity and patency of VAD; dressing; and stabilization device."[1]

[1] Alexander, Mary, ed. Standard 44. Vascular Access Device Removal – Practice Criteria I. Short Peripheral Catheters: Infusion Nursing Standards of Practice, 2nd Ed. *Journal of Infusion Nursing*. 2011;34(1S):57 (Supplement).

The April 23, 2014, R3 Committee meeting agenda included a discussion about PIV site rotation and the INS Standard. (Exhibit EP14.a: 042314 R3 Minutes) A representative from the UVA Health System IV team, Linda Harris, RN, Clinician II, was invited to provide consultation and clinical expertise. After a review of the high-level evidence and discussion of the findings, Strider proposed that, "The replacement of PIV sites in adult patients will be changed from every 72-96 hours to a replacement only when clinically indicated. Such clinical indications will include, but are not limited to, erythema around the site, difficult flushing of the site, pain at the site, edema / infiltration at the site and / or drainage of fluid from the IV site." The proposal was voted upon and approved based upon the evidence.

**EP14 Table 1: R3 Committee Members and Guests Attending 4/23/2014**

| Name | Discipline | Title | Department |
|---|---|---|---|
| David Strider | Nursing | RN (Chair) | PICU |
| Barbara Trotter | Nursing | RN Clinician IV (Vice-Chair) | 3 Central / 3 West |
| Linda Harris | Nursing | RN Clinician II (Guest) | IV Team |
| Sheila Adldoost | Nursing | RN Care Coordinator - Clinician III | 5 East |
| Rebecca Gilbert | Nursing | RN Clinician IV | Perioperative |
| Muriel Hollandsworth | Nursing | RN Clinician II | Transitional Care Hospital |
| Jenny Kutsch | Nursing | Advanced Practice Nurse 1-Nurse Practitioner | NICU |
| Lisa Letzkus | Nursing | Advanced Practice Nurse 2- Nurse Practitioner; Assistant Director, Nursing Research Program | Pediatrics / Nursing Governance Programs |
| Kelly Near | Library | Nursing Public Health and Hospital Liaison Librarian | Health System Library |

| | | | |
|---|---|---|---|
| Daniele Ottinger | Nursing | Advanced Practice Nurse 2- Nurse Practitioner | Pediatrics |
| Linda Peffley-Firer | Nursing | Nurse Residency Coordinator | Nursing Education |
| Melly Turner | Nursing | RN Clinician IV | Heart and Vascular |
| Kelly Wesson | Nursing | RN Clinician II | 5 Central |
| Brigid Wonderly | Nursing | RN Care Coordinator - Clinician III | Kidney Acquisition |

At the May 2014 Clinical Practice Committee (CPC) meeting, Strider presented the R3 Committee practice change recommendation and the supporting evidence. (Exhibit EP14.b: 04 2014 PIV Evidence-Based Template) The CPC Committee readily approved the practice change. (Exhibit EP14.c: 052714 Clinical Practice Committee Minutes) The new practice and associated procedure was introduced through the June PNSO Practice News, page 1 (Exhibit EP14.d: June 2014 Practice News), as well as through local practice committees.

The availability of the INS standards supported the clinical nurses' ability to readily identify the evidence and realign their practice.

**Example 2:** Resource Utilization to Build a Clinical Protocol for Continuous Renal Replacement Therapy-Calcium Chloride and Calcium Gluconate Titration

Computer stations throughout all of the patient care settings allow for direct access to library resources. These library linkages serve as the primary connection for clinicians providing direct care. Databases within the library can be accessed by any clinician within UVA Health System.

When sodium citrate is used as an anticoagulant to prevent clotting of the blood circulation system during continuous renal replacement therapy (CRRT), a continuous calcium infusion must be used concomitantly. The citrate chelates ionized calcium, an essential co-factor in the clotting cascade, causing the calcium to be unavailable for clot formation. The citrate / calcium chelate is then dialyzed off, and the blood returned to the patient is therefore very low in calcium. When sodium citrate is used, the critical care RN must titrate the calcium infusion every six hours to maintain a serum ionized calcium range of 4.5-5.5 mg/dL.

In May 2013, Stephene Hertwig, BSN, RN, CCRN, and Katelyn Overstreet, BSN, RN, CCRN, both Clinician IIs in the MICU, identified the lack of a unified protocol to guide the clinician in calcium infusion titration. They noted the disparity between the

maintenance of the infusions and the training of nurses on how to manage them. They also cited the important differences between the management of calcium chloride and calcium gluconate infusions. Hertwig and Overstreet were concerned about the critical care RNs' knowledge of the evidence and the practice implications of instilling the infusions. They agreed that standardized care was the best approach.

Following their discussion of this issue at the May meeting of the Critical Care Procedure Committee, Hertwig and Overstreet partnered with Amanda Zomp, PharmD, Clinical Pharmacist, to review the literature and identify evidence-based practices to guide the infusion of calcium during CRRT. Using the MICU desktop computers, they accessed the link to Claude Moore Health Sciences Library. Beginning with the Claude Moore Health Sciences Library website, they used the available search engines to mine the literature for manuscripts specific to their need. Among the many citations that they reviewed, they found three relevant articles:

- Palsson R and Niles JL. Regional citrate anticoagulation in continuous venovenous hemofiltration in critically ill patients with a high risk of bleeding. *Kidney Int*. 1999;55:1991-1997.
- Tobe SW, Aujila P, Walele AA, et al. A novel regional citrate anticoagulation protocol for CRRT using only commercially available solutions. *J Crit Care*. 2003;19:121-129.
- Tolwani AJ, Prendergast MB, Speer RR, et al. A practical citrate anticoagulation continuous venovenous hemodiafiltration protocol for metabolic control and high solute clearance. *Clin J Am Soc Nephrol*. 2006;1:79-87.

The three key articles provided the clinical foundation for the development of a practice protocol.

Together, the clinicians analyzed the published manuscripts and garnered the clinical details needed to draft a protocol to standardize the infusion of calcium during CRRT. Once the draft protocol was written, the team sought input from stakeholders, to whom Hertwig presented a summary of the initial problem, the work they had conducted to seek resolution and the final proposed resource documents resulting from their work. These groups included the August 2013 PNSO Clinical Practice Committee (Exhibit EP14.e: 082713 CPC Minutes), the Pharmacy and Therapeutics Committee and final approval of the protocols by the Patient Care Committee in November of 2013. (Exhibit EP14.f: 110713 Patient Care Committee Minutes) The new evidence-based resources were made available to clinicians in November and communicated through the December 2013 PNSO Practice News. (XREF Exhibit NK3.d: 12/2013 Practice News)

**Participants:**

**EP14 Table 2: Participants, Calcium Infusion Protocol Development**

| Name | Discipline | Title | Department |
|---|---|---|---|
| Stephene Hertwig | Nursing | RN Clinician II | MICU |
| Katelyn Overstreet | Nursing | RN Clinician II | MICU |
| Amanda Zomp | Pharmacy | Clinical Pharmacist | Pharmacy |
| Rebecca Haynes Hockman | Pharmacy | Pharmacy Clinical Coordinator | Critical Care Internal Medicine |
| Judy Kauffman | Nursing | Nurse Manager | Renal Unit |
| Rasheed Balogun | Physician | Associate Professor of Medicine | Nephrology |

Clinical practice protocols for calcium chloride infusion titration in CRRT and calcium gluconate infusion titration in CRRT were developed, approved and implemented. Hertwig and Overstreet partnered with Laurie Brock, MSN, RN, Nurse Informaticist, to create links to the calcium protocol on the Medication Administration Record (MAR) within Epic. This saves time for the physicians and nurses and increases safety. The work of these clinical nurses was supported by the structures in place to facilitate the use of evidence-based resources. Their efforts resulted in new protocols that allow nurses to autonomously and safely manage calcium replacement in critically ill patients.
(Exhibit EP14.g: Calcium Chloride Infusion Titration in CRRT Protocol)
(Exhibit EP14.h: Calcium Gluconate Infusion Titration in CRRT Protocol)