

# Enhancing Nursing Students' Experience in the Assessment and Care of Vascular Access Devices

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## Abstract

**Background:** Bachelor of Science in Nursing students get minimal exposure or experience in the assessment and care of vascular access devices (VADs) let alone the placement of such devices. Students in our university nursing program receive no structured experience. Students learn how to assess and care for VADs in the clinical setting while working with clinical faculty and staff nurse mentors.

**Purpose:** The purpose of this pilot program was to increase the awareness and understanding of VADs for third-year nursing students to enhance their comfort level in assessing and caring for these devices.

**Methods:** Thirty-two third-year nursing students, in groups of 8, participated in this pilot program in addition to their usual academic and clinical assignments. The 4 structured components of this program included a didactic session to share basic VAD information, simulation laboratory time to practice peripheral intravenous line insertion, a 4-hour one-to-one shadowing experience with a vascular access service team registered nurse providing patient care, and a wrap-up session by the vascular access service team educational nurse coordinator to provide debriefing and additional information.

**Conclusions:** Students who participated in this pilot program expressed an increased level of comfort regarding VADs. They came away with knowledge that other nursing students in the program do not receive during their academic and clinical time.

**Keywords:** clinical staff and faculty collaboration, nursing education, nursing students, vascular access education

## Introduction

As the body of knowledge in nursing science grows, schools that educate nurses are less able to focus on the growing number of detailed technical skills used in everyday practice. More and more, employers are challenged to extend new employee orientation or otherwise provide education of bedside skills. In an effort to promote excellence in nursing education, nursing practice, and scholarship, a partnership has been formed between our health care system and the university's School of Nursing. Together, nurses from the health system, in partnership with the School of Nursing work toward clinical excellence.

In a summary of the literature related to clinical learning of nursing students, O'Connor<sup>1</sup> identified several themes, including students' desire to focus on skill mastery before entering more complex patient care situations. Undergraduate nursing students desire real-world experience.<sup>2</sup> With > 90% of hospitalized patients having some type of venous access device, students want to be confident not only in providing patient care but also in understanding what is under the skin. This is important because it is estimated that a significant portion of nursing work time is allocated to care related to vascular access devices (VADs).<sup>3,4</sup>

This project was a collaborative effort to provide third-year nursing students with a broader experience in the assessment, care, and understanding of VADs in addition to exposure to a specialty practice in nursing. Students traditionally get minimal exposure and experience in the assessment and care of VADs. They may not understand the difference in purpose and care between a standard peripheral intravenous line, a midline, and a central line. The vascular access service team's (VAST) educational nurse coordinator (ENC) and university clinical faculty

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identified a need for additional student education and practice. Working together, a pilot program was developed.

### Background

The VAST of a large tertiary care level-1 trauma medical center places in excess of 40,000 peripheral intravenous lines and > 3,500 peripherally inserted central catheters (PICCs) annually to both inpatients and outpatients. With a team of nurses always present to place VADs and aid in the assessment and care of these devices, bedside nurses become increasingly reliant on VASTs and bedside nursing skills in this area may decrease because of lack of practice. In institutions without a VAST or specialty nurses, the care of VADs falls to bedside registered nurses. Unfortunately, nursing education about VAD management may be less of a priority due to competing competencies.<sup>5</sup> Although not ideal, nurses learn VAD care during their clinical placements while in nursing school or during orientation to what may be their first nursing position. Still, clinical areas continue to report a lack of practice readiness in graduate registered nurses.<sup>6</sup>

In our system, third-year nursing students are placed in a medical-surgical unit with their clinical faculty. Each student works with a staff nurse mentor whose experience varies from seasoned nurse to < 1 year of experience. Student experience with the assessment and care of VADs is essential in preparing for future patient care. The level of training and education that a student receives regarding the assessment and care of VADs will depend to a large extent on the level of expertise that the mentor possesses. The patient population of the nursing unit to which students are assigned may also affect the level of exposure to VADs. A rehabilitation unit may have fewer or different types of VADs compared with an oncology unit or an intensive care unit, for example.

The National Patient Safety Goals established by The Joint Commission require education of nurses related to the management of central lines. Also required is the implementation of evidenced-based policies and practices aimed at reducing central line-associated bloodstream infections.<sup>7</sup> Infection rate data and outcome measures are closely monitored both institutionally and nationally. Students, while working with staff nurse mentors, are involved in all aspects of patient care, including the safe and effective management of VADs. Providing education will enable future clinicians to be equipped with the knowledge and skills for optimal care, reducing the incidence of catheter-associated bloodstream infections. Avoiding these infections will positively affect patient outcomes related to unexpected complications, additional health care costs, and hospital length of stay.

To get a better understanding of what other 4-year nursing schools provide to their students regarding VADs, an informal inquiry was made to local institutions. This inquiry showed a wide range of didactic and clinical education time spent with nursing students. Some schools have a robust component of vascular access education in their nursing curriculum, whereas others provide minimal exposure.

### Methodology

Third-year nursing students in our university program spend 16 hours/week in an acute care unit at the university medical

center. During this 12-week rotation through medical-surgical nursing they assume complete care for patients under the direction of a staff nurse mentor and a clinical faculty member. Depending on the specialty of the unit assigned to the nursing student, experiences vary; however, almost every patient receives an intravenous infusion during his or her hospital stay. During the 2012 winter and fall semesters, 32 students participated in a collaborative effort between our School of Nursing clinical faculty and the health system VAST to supplement academic and clinical learning.

Each student was provided with didactic information by a clinical instructor during postconference. This included a brief review of anatomy of the vasculature of the arm, basic venipuncture techniques, potential complications, and highlights of the current hospital procedures for infusion therapy. Students were asked to review hospital policy on their own time before meeting with the VAST. The VAST ENC was invited to present to the nursing students. During the 60-minute presentation students were able to touch various access devices and dressings. Students learned how to visually identify the size of the peripheral catheter used based on its color as well as see and touch all of the various sizes. Discussion included the most common size used and when and why other sizes might be more appropriate.

Time was also devoted to PICCs. Students expressed surprise at how long the catheter was and what was involved in determining proper placement. Students had seen VAST nurses on their units daily but had little understanding of what was involved in PICC line insertion or the reasons for the rigorous vigilance to sterility. The difference between power and nonpower PICC lines was demonstrated, as well as the risks of misusing a line. Students were provided with a chart reviewing the average gravity flow rate for both peripheral and PICC lines, highlighting the differences in size. Infusion ports were also displayed and discussed, including why ports might be used rather than central lines and the advantages and disadvantages of each. During the presentation students were encouraged to ask questions and handle all materials.

After viewing and handling the various devices students had many questions about insertion of PICC lines, accessing ports, assessment of insertion sites, and common troubleshooting tips that could be used in daily care. Questions included when to call the VAST, what to do when there is air in a line, when to flush a line with saline and when to flush with heparin, how to know if a PICC is in place, how to tell if a PICC tip has moved, what to document about a line, when to change a line, how long can a line stay in place, what to do if the skin around an insertion site looks red, what to do if a central line or port becomes infected, and next steps if a nurse cannot place a peripheral line. The VAST ENC answered all questions and reviewed basic site care as well as the role of the VAST. Whenever possible, research evidence was presented to support decisions related to daily care. Students quickly became aware of the nuances of the VAST nurse's skills and began to see it as a specialty. This prompted further questions about preparation and experience needed to join a VAST.

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