

APPLICATION FORM

Title of Entry: Development of a Nurse Driven Vascular Access Team

Division: Medium Organizations

Award: In Safe Hands

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Date Implemented: 06/13/2016
Date Results Achieved: 03/31/2017

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Jeffrey Farrell, BSN, RN

EXECUTIVE SUMMARY

Title: Development of a Nurse Driven Vascular Access Team

Description:

Vascular access was a challenge in a 171 bed community hospital. In response to this, a team was implemented in June of 2016 to support clinical nurses and reduce Central Line Blood Stream Infections (CLABSI) by decreasing variations in practice.

Evidence:

Clinical evidence showed a higher than average rate of CLABSIs. There was also a large percentage of central venous catheters, specifically Peripherally Inserted Central Catheters (PICC)s, that were being inserted for the sole indication of obtaining access and blood draws for the patient.

Baseline data:

Baseline survey revealed a 45% knowledge deficit related to central line care and maintenance. In addition, compliance with all steps of the infection prevention bundle was low. There was 11% compliance with the use of a central line insertion checklist meant to ensure that the infection prevention practices at the time of line insertion were followed. A central line dressing audit was also performed. The baseline compliance results were 43%. The rates of CLABSI were 1.77 and 2.28 respectively for Fiscal Years 2015 and 2016 -- both higher than the PA Department of Health benchmark of 0.73. Approximately 33% of PICCs were inserted for the sole purpose of obtaining vascular access.

Intervention:

After review of current literature and professional standards, a nurse led Vascular Access Team was implemented. Mandatory education and demonstration of sterile central line dressing changes for all Registered Nurses throughout the hospital was conducted with return demonstration required. In addition, a midline and ultrasound guided IV program was initiated.

Results:

PICC line insertions decreased by 36% when compared to FY 2016 and 32% when compared to FY 2015. Tunneled Central Venous Catheters (CVC) insertions in FY 2017 decreased by 55% when compared to FY 2016 and decreased by 50% compared to FY 2015.

It is estimated that the overall cost savings totals between \$300,000 and \$500,000. Anecdotally, an increase in patient and staff satisfaction also occurred as evidence by the numerous patient comments about how the vascular access service enhanced their patient experience.

Assessment

A 171-bed community hospital identified the need for vascular access support. The first vascular access team was implemented in June of 2016 by a vascular access nurse specialist with support from nursing and executive administration. A needs assessment was performed including a comprehensive review of policies related to Central Venous Access Devices (CVADs) and infection control practices pertaining to the insertion, maintenance and removal of vascular access devices (VADs). Meetings were held with Board Quality, Medical Staff Board, Hospitalists, Intensivists, Interventional Radiology (IR), Infection Prevention, Nursing Education and Staff Development, Directors and Managers of Nursing, and ancillary departments to help identify challenges and brainstorm ideas.

Initial assessment identified the need for: daily vascular access rounds education related to the care and maintenance of IV lines, as well as the proper device selection. During the education process, the need for an alternate device was identified and the Midline program was introduced.

The vascular access specialist compiled baseline data on Central Line Acquired Bloodstream Infection (CLABSI) rates. The rates of CLABSI were 1.77 and 2.28 respectively for Fiscal Years 2015 and 2016 which were above the Pennsylvania Department of Health Average of 0.73, despite a previously implemented infection control bundle for care and maintenance of central lines. Central Line Device Utilization Ratios (DUR) were also obtained hospital wide as well as by individual unit. It was discovered that knowledge of central line care and maintenance, as well as compliance with all parts of the infection prevention bundle were both extremely low. A needs based assessment was sent via E-mail to all nurses in the hospital. There were 78 responses and an average score of 55% on the central line identification and maintenance knowledge assessment. A central line dressing audit was performed hospital wide. The baseline compliance results obtained prior to implementation of a vascular access team were 43%. A central line dressing, following all parts of the infection control bundle, was defined as a dressing which was clean, dry and intact, with date of last dressing change written on the dressing and a Chlorhexidine Gluconate (CHG) product in place at the site of central line insertion.

There was no use of a midline device prior to the development of a vascular access team. Approximately 33% of PICCs were inserted for the sole indication of gaining access to the patient's vasculature. Midlines and the use of ultrasound by Registered Nurses were not previously used for gaining access to a patient's vasculature prior to a vascular access team.

Intervention

The vascular nurse access met with all departments initially involved in the assessment phase and discussed the overall action plan to obtain buy-in. A rounding schedule was developed and a tool to be used daily was implemented. Assessments included device type and patency, indication for use and adequate dressing for CVAD. While rounding, the vascular

access specialist often was consulted by physicians or Registered Nurses to assist in the plan of care and determine the correct VAD for the patient's prescribed treatment.

Policies were updated to reflect current evidence based practices. Infusion Nurse Society (INS) standards of practice, current Center for Disease Control guidelines, the Agency for Healthcare Quality and Research (AHRQ) as well as countless other evidence based references were utilized for hospital policies, competencies and education. Clinical Practice Guidelines were created for all aspects of VAD insertion, maintenance and removal, and made available for staff nurses as a reference. Mandatory education was provided and demonstration of sterile central line dressing changes for all Registered Nurses throughout the hospital was performed with the Vascular Access Specialist present and Nursing Education and Staff Development facilitation.

A CLABSI Taskforce was created as a sub-committee of the Hospital Acquired Infection Committee with the vascular access specialist as lead. This taskforce is comprised of nursing leadership, nursing education and staff nurses. Standardized port access and central/PICC/midline dressing change kits were developed and approved to keep consistent practice when accessing implanted ports and changing midline and CVAD dressings throughout the hospital. Central line dressing and IV tubing audit tools were created and used on each unit along with the creation of advantageous changes to the electronic medical record (EMR) pertaining to vascular access documentation. The changes in the EMR enabled documentation to be more readily available to the bedside nurse to improve compliance with parts of the infection control maintenance bundle pertaining to date of last central line dressing change and date of insertion of VAD.

The rate of PICC insertions drastically decreased with daily rounding by a vascular access nurse trained to use ultrasound for peripheral intravenous (PIV) and midline insertions. Consults for PICC lines were ordered through Interventional Radiology and a call was placed to the vascular access team to assess if a PICC was the most appropriate VAD for the patient's prescribed therapy. If the PICC was ordered for the sole purpose of difficulty in obtaining vascular access, an ultrasound guided peripheral intravenous catheter (USGPIV) or a midline was inserted. A midline was inserted if the prescribed therapy was expected to be greater than 5 days. Midlines were also inserted for administration of approved antibiotics with a prescribed duration of administration of ≤ 29 days for discharge. Long term care facilities, rehabilitation units and home infusion companies were asked for lists of approved antibiotics to be administered via a midline, so if the patient was discharged from the hospital they would have the appropriate access for the prescribed therapy. Education was also provided for these facilities.

Results

- The number of PICC lines inserted to date in Fiscal Year 2017 is 36% less than the number inserted in all of Fiscal Year 2016 and 32% less than the number inserted in Fiscal Year 2015.
- The number of tunneled central venous catheters inserted was 55% and 50% less for the same time periods. (Figure 2)
- The estimated average cost of a PICC line insertion in an Interventional Radiology suite is \$1,200-\$2,000. The reduction in the number of unnecessarily inserted PICC lines and tunneled catheters thus far in Fiscal Year 2017 has resulted in a cost reduction of between \$115,000 - \$200,000 compared to Fiscal Years 2015 and 2016.
- The reduction in the incidence of central line-associated blood stream infections in fiscal year 2017 (Figure 3) can be attributed to:
 - Consistent adherence to the evidence-based central line care and maintenance bundle
 - Daily rounding on patients with central lines by the Vascular Access Specialist
 - Reduced use of central lines, especially in patients who are not in critical care.
 - Ongoing nursing education on the maintenance of vascular access devices
- The raw number of CLABSIs from:
 - Fiscal Year 2015 through March was 5 with an estimated cost of \$229,070.
 - Fiscal year 2016 through March was 10 with an estimated cost of \$458,140.
 - July 2016 through March 2017 was 2 with an estimated cost of \$91,628.

The cost reduction in just the first year of the program was \$366,512!

- The DUR of central line devices for the current fiscal year is 0.11 (figure 4).
- Central line device utilization rate (DUR) in fiscal year 2017 was 0.38, compared to a rate of 0.57 in fiscal year 2016, reflecting that lines are now removed as soon as they are no longer indicated.
- Reduction in the use of central lines contributes to a lower CLABSI rate. At the same time, the use of peripheral catheters and the associated costs increased by approximately 11% from fiscal year 2016 to fiscal year 2017.
- The introduction of “midlines” also results in an added cost of approximately \$2400 per month. The total monthly cost increase for peripheral catheters and midline insertion supplies was \$4265.37, an increase of \$38,388/year.
- The combined total cost reduction that resulted from the decreased use of PICC lines, decreased incidence of CLABSI and factoring in the increased cost of supplies for peripheral and midline catheters is approximately \$443,124 - \$528,124 when comparing Fiscal Year 2015 and 2016 with Fiscal Year 2017.
- The deficit for staff nurse knowledge pertaining to CVADS decreased from a 45% knowledge deficit to a 32% knowledge deficit as seen in results of a survey prior to and after implementation of a nurse driven vascular access team.

- Implementation of a vascular access team has resulted in increased patient satisfaction. Patients request vascular access team involvement based on prior experiences with the team. Patients have commented
 - “You do not know how much it means to only be poked once.”
 - “Why doesn’t every hospital have you?”
 - “This is such a huge patient satisfier, why haven’t they done this before?”

There are numerous positive statements from patients who have directly benefitted from the implementation of a vascular access team. In a world where patient satisfaction directly relates to reimbursement, a vascular access team can be an invaluable asset.

Adaptability

The implementation of a vascular access team in a community hospital is adaptable to any other hospital willing to spend the time and money to understand the importance of the appropriate vascular access device utilization and not the device that is most convenient for the healthcare provider. A dedicated vascular access team is needed to round on all CVADs in the hospital and implementation of an educational program including audits of CVAD insertion, maintenance and prompt removal. As seen above in the results, the vascular access team more than pays for itself, and therefore, not having funds for additional equipment or the FTEs should never be an excuse for not having this influential program in the smallest of community hospitals.

In order to maintain results and to understand areas of improvement in the vascular access program, continued data collection on all aspects of VAD insertion in the hospital is needed. Continued follow up and presentation of data and process improvement needs to be presented to the Quality Council, hospital executive administration and the medical board. Continued education throughout the year is needed for frontline staff on the maintenance of all VADs.

Opportunities for program enhancement include: more efficient ways to collect data on all VADs hospital wide, a streamlined process to obtain a vascular access consult via the Electronic Medical Record and an automated Central Line care and maintenance bundle. Some of these are currently underway through our hospital performance improvement process.

Supporting Appendices

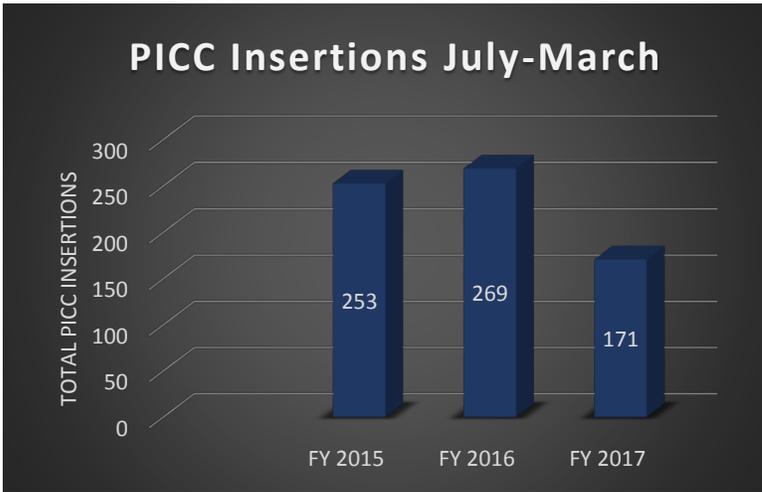


Figure 1

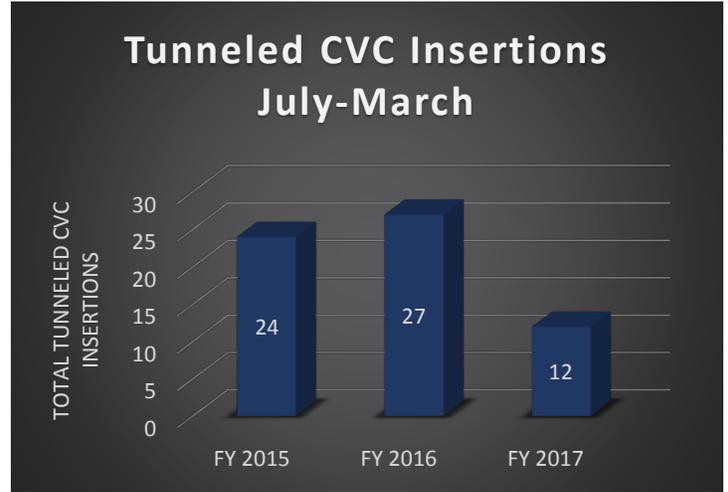


Figure 2

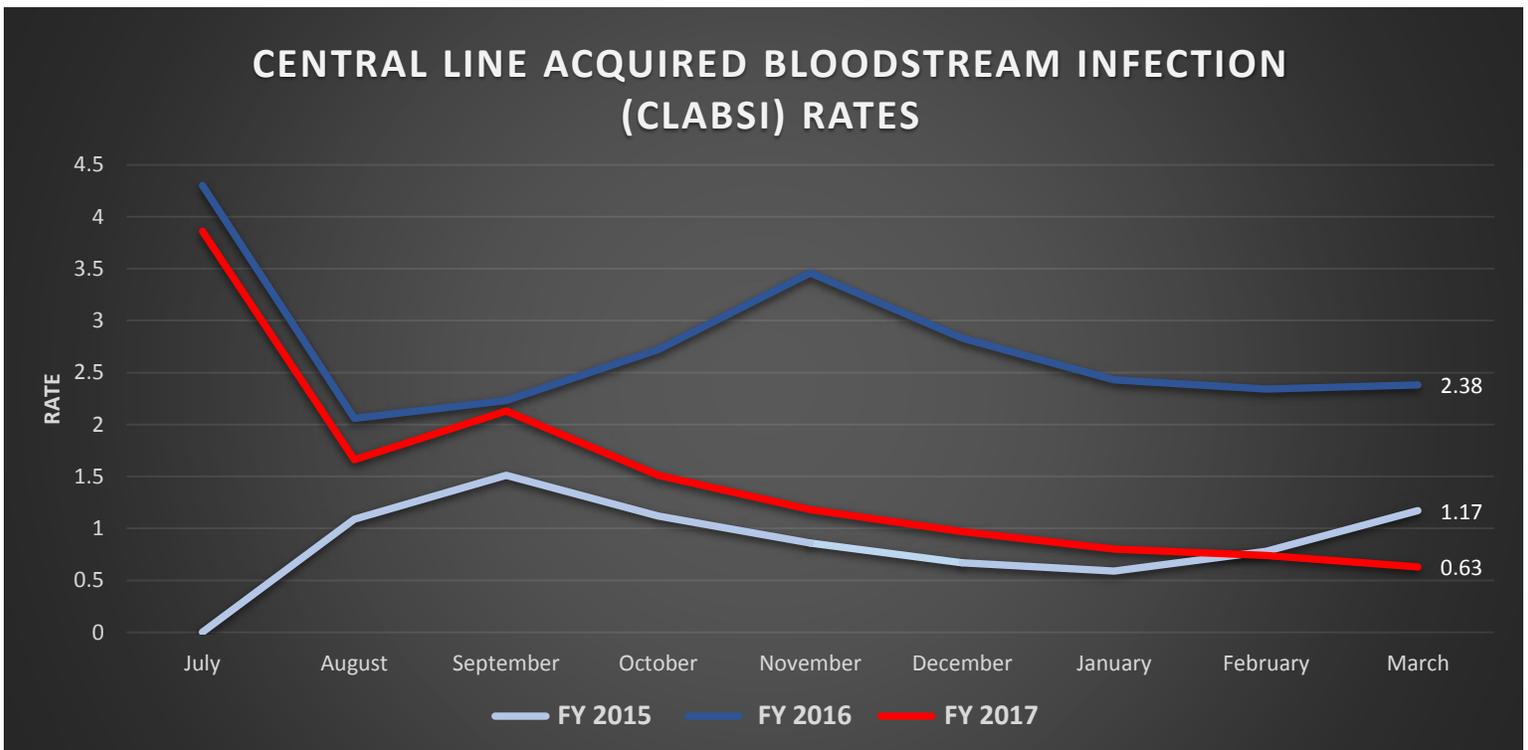


Figure 3

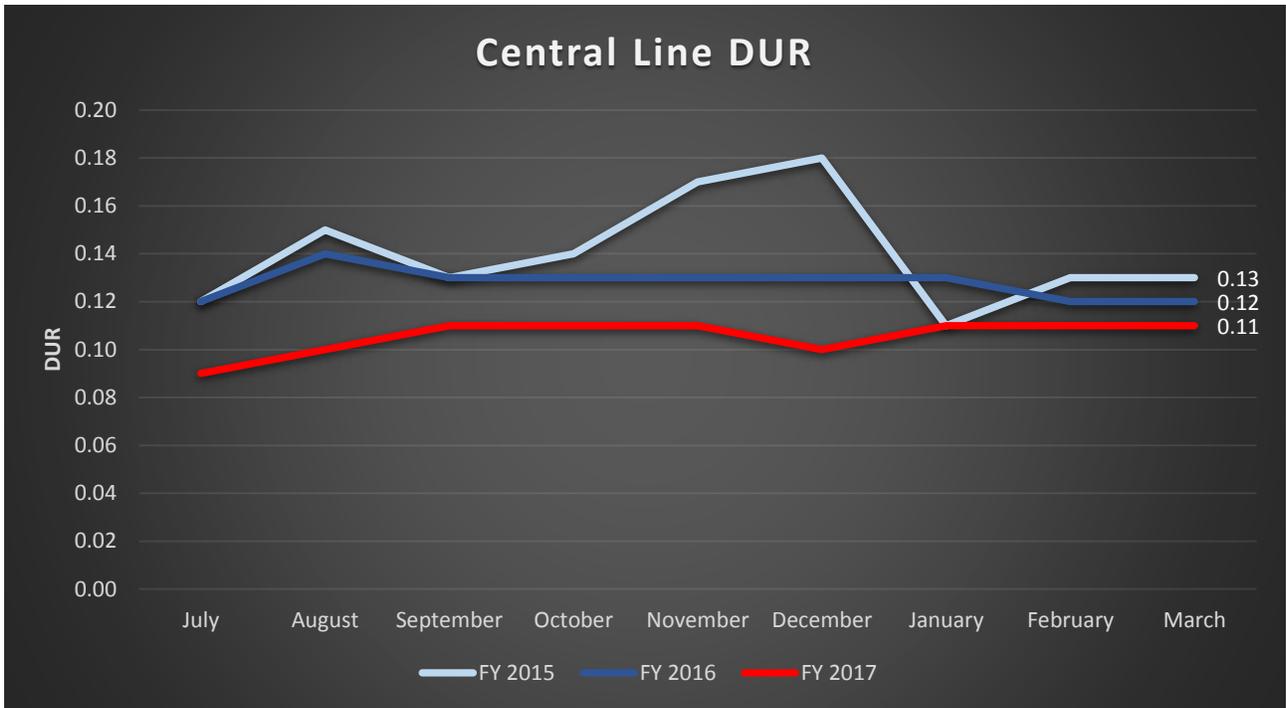


Figure 4

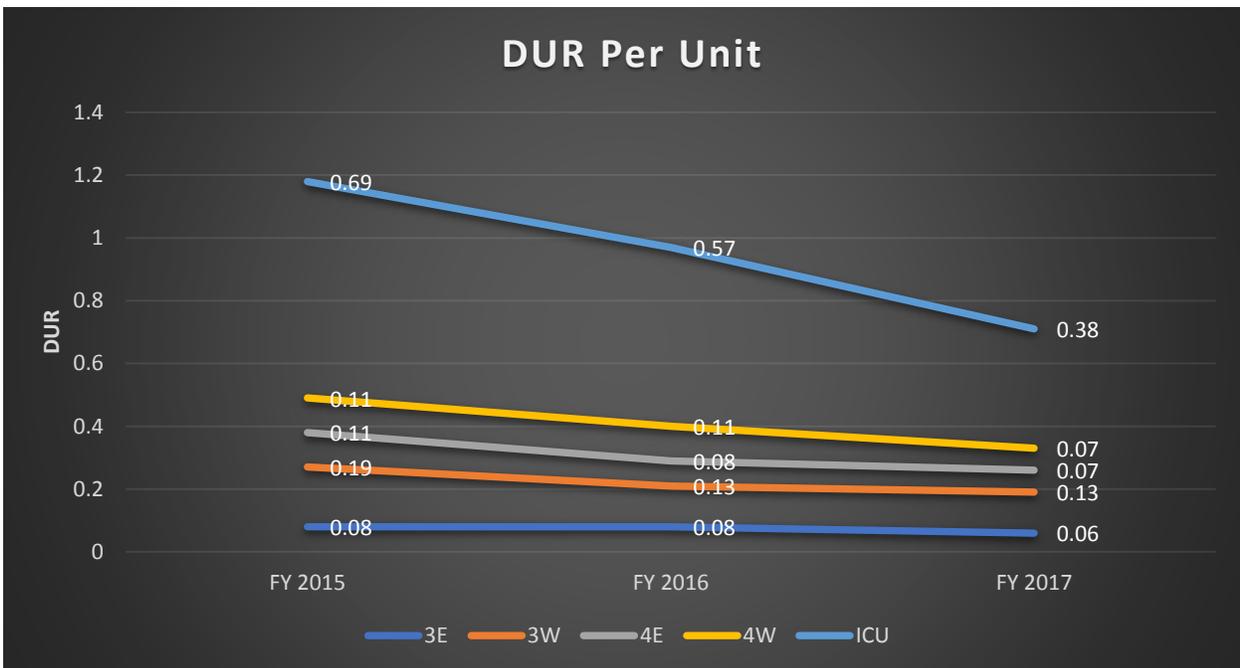


Figure 5