



# Positive Influence of a Dedicated Vascular Access Team in an Acute Care Hospital

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## Abstract

*The benefits of reduction in central line-associated bloodstream infections at Banner Boswell Medical Center in Sun City, Arizona, include decreased expenses and increased efficiency, quality of care, and patient satisfaction; improved patient outcomes with proper device selection; 24 hours a day, 7 days a week specialized registered respiratory therapist and lines team availability; standardization of peripherally inserted central catheter and central venous catheter insertions, maintenance, and removal; better workflow; and resource and cost center centralization.*

**Keywords:** Vascular Access Team, CLABSI, PICC, CVC

## Introduction

**B**anner Health, based in Phoenix, Arizona, is among the largest nonprofit health care systems in the country and the leading nonprofit provider of hospital services in all the communities served. Optimization is now hardwired into Banner's organizational culture as a way to do business. It is just one of the ways that Banner is looking to be efficient and effective while identifying cost-saving opportunities in the challenging health care environment.

Banner Boswell Medical Center (BBWMC), part of Banner Health, is a 501-bed acute care hospital serving a Phoenix suburb comprised primarily of retired residents.<sup>1</sup>

## Aims

Facility-based optimization (FBO) became a major system focus for Banner Health in 2013. FBO focuses on implementing recommendations that streamline processes, increase efficiency, and reduce variations in care provided at all facilities across the system. The streamlining process involves identification of strategies used at different facilities and

implementation of these strategies across the entire system. FBO encourages submission of new ideas for systemwide improvement for review. More than 150 FBO initiatives were implemented in 2014. One initiative supported improvement in patient care by addressing the importance of correct use, insertion, management, and removal of peripherally inserted central catheters (PICCs) and central venous catheters (CVCs), also referred to as central lines. BBWMC was able to identify that a dedicated vascular access team is able to provide lower infection rates, costs, and unanticipated patient outcomes.

## Methods

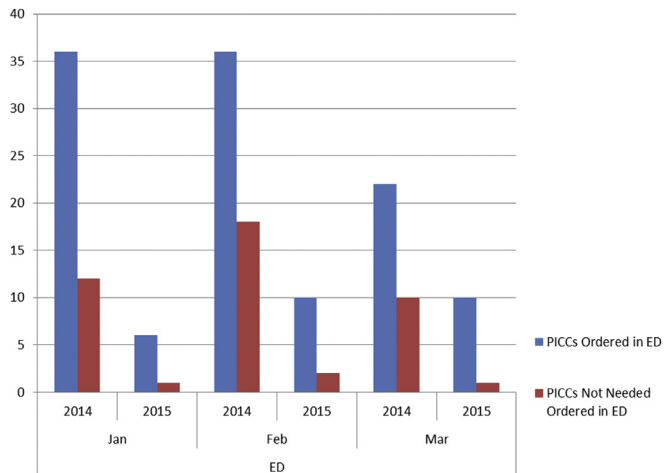
The BBWMC FBO supported the integration of registered respiratory therapists (RRTs) in the role of CVC management. The Board of Respiratory Care Examiners advised whether the CVC insertion was performed under the direct supervision of qualified, currently licensed medical doctor or osteopathic physician, and the RRT completed a specialized training program with competency reviews in place, then this fell within his or her scope of practice.<sup>2</sup>

RRTs can complete a specialized training program with competency reviews that result in this new skill being included within his or her scope of practice. RRTs have been involved with vascular access for a very long time, although that is not well understood in health care. Arterial catheter insertions have been a mainstream vascular service for respiratory practitioners since the 1980s. Sometimes respiratory care practitioners

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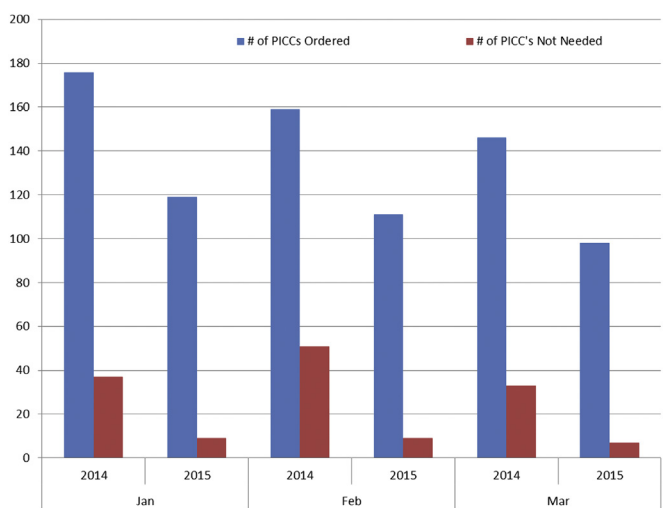
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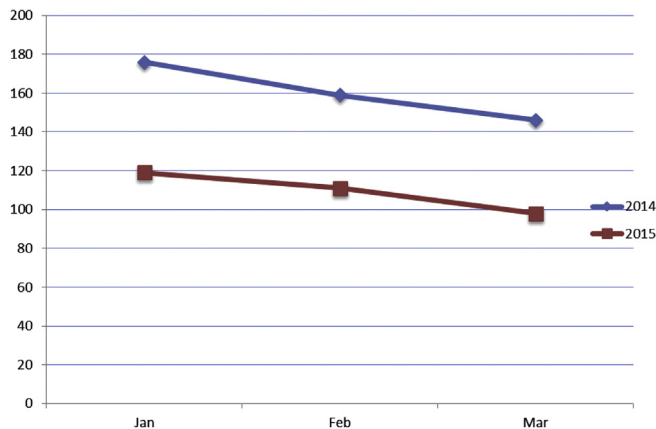
**Figure 1. Decreased peripherally inserted central catheter (PICC) orders in the Banner Boswell Medical Center Emergency Department (ED) from 2014-2015 and a corresponding decrease in orders for PICC lines not meeting clinical indications.**

(RCPs) were part of a subset team called monitoring technicians. Monitoring technicians would set up vascular pressure lines, assist with central line insertions, assist with floating flow direct catheters, and engage in a wide variety of access-related procedures. In some parts of the country RCPs were among the first to start placing PICCs at the bedside and utilizing ultrasound.

Vascular access is seen in most parts of mainstream health care as a nursing function. However, there are multiple disciplines and professions that are involved with vascular access. Areas that are not readily thought of, such as prehospital and radiology, in rural areas use practitioners from a large variety



**Figure 2. Increased peripherally inserted central catheter (PICC) orders for indicated consumers and a decrease in nonindicated PICC placements.**



**Figure 3. First quarter 2014 vs 2015 total number of peripherally inserted central catheters ordered.**

of professional groups to provide services related to vascular access. For the RCPs at BBWMC, performing vascular access has been many years in the making.<sup>3</sup>

The BBWMC Infection Prevention Department monitors central line-associated bloodstream infections (CLABSIs). The data collected demonstrate a steady decrease in CLABSIs, which is a significant finding promoting the health of the older adult population. This is especially important because BBWMC is located in the heart of Sun City, Arizona—an area that caters to geriatric patients. In 2010, persons aged 65 years and older comprised 74.9% of the area residents.<sup>4</sup>

Hospital-acquired infections (HAIs) have been an area of focus in health care. CLABSIs account for approximately 10% of HAIs.<sup>5</sup> Such infections greatly prolong hospitalizations and increase resource use. Furthermore, CLABSIs are important and deadly HAIs, with reported 12%-25% mortality.<sup>6</sup> Occurrence rates for CLABSI can be dramatically reduced by proper sterile insertion technique, optimal insertion-site selection, proper line maintenance, and minimized total number of central line days. Based on a 25% mortality rate, a CLABSI carries an excess health care cost of \$16,550; prevention of CLABSI in intensive care units alone could reach \$1.8



**Figure 4. First quarter 2014 vs 2015 peripherally inserted central catheter average wait time from order to insertion.**



**Figure 5. Central line-associated bloodstream infection rates.**

billion and the number of lives saved as high as 27,000.<sup>6</sup> Since a dedicated lines team was created at BBWMC in 2014, there has been a steady decrease of CLABSI occurrence throughout the Banner system.

At BBWMC, the vascular access team is available 24 hours a day, 7 days a week for insertion, maintenance, and removal of all central lines. Goals of the dedicated lines team are to decrease patient wait time for line insertion and increase the capacity to insert appropriate lines at the right time for the right patient. With vascular access team members being able to place multiple types of lines (eg, PICCs, CVCs, midlines, and intravenous lines) they are able to assess patients, speak to ordering providers, and place the best line possible for the situation. It was also hypothesized that improved patient outcomes could be achieved through reduction in CLABSI with implementation of the Institute of Healthcare Improvement care bundle. It was believed that the combination of the Institute of Healthcare Improvement care bundle and the use of a dedicated team intended for line insertion, care, and maintenance would lead to decreased CLABSI rates, as well as less morbidity and mortality.

### Results

During implementation of this FBO, the BBWMC cardiopulmonary department collected data and compared results for first quarter 2014 to first quarter 2015. According to data analysis, the hospital was experiencing:

- Decreased PICC orders in the Emergency Department from 2014-2015 and a corresponding decrease in orders for PICC lines not meeting clinical indications (Figure 1),

- Increased PICC orders for indicated consumers and a decrease in nonindicated PICC placement (Figure 2),
- Decreased total number of PICC line orders (Figure 3),
- Decreased average patient wait times from point of order entry to point of line insertion (Figure 4), and
- Decreased CLABSI rate (Figure 5).

### Conclusions

The benefits of a dedicated vascular access team include reduction in CLABSIs, which results in decreased expenses and increased efficiency, quality of care, and patient satisfaction; improved patient outcomes with proper device selection; 24 hours a day, 7 days a week specialized RRT and lines team availability; standardization of PICC and CVC insertions, maintenance, and removal; better workflow; and resource and cost center centralization. Areas for continued improvement include continuing education with vascular access team staff, collaboration with nursing units, increased choice for device selection, and constant reassessment for improvement within the Banner system for the identification and implementation of best practices in the interest of improved patient outcomes.

### Disclosures

The authors have no conflicts of interest to disclose.

### References

1. Banner Boswell Medical Center. Fast facts about Banner Boswell. <https://www.bannerhealth.com/Locations/Arizona/Banner+Boswell+Medical+Center/About+Us/Fast+Facts.htm>. Accessed October 23, 2015.
2. Board of Respiratory Care Practitioners. Board meeting minutes: April 19, 2007. [https://respiratoryboard.az.gov/sites/default/files/documents/files/2007-04-19\\_0.pdf](https://respiratoryboard.az.gov/sites/default/files/documents/files/2007-04-19_0.pdf). Accessed October 23, 2015.
3. Ramirez C. Respiratory therapists perform PICC line insertion. *AARC Times*. 2002;26:62.
4. US Census Bureau. State & community quick facts: Sun City CDP, 2015. Arizona. <http://quickfacts.census.gov/qfd/states/04/0470320.html>. Accessed October 23, 2015.
5. Centers for Disease Control and Prevention. Healthcare-associated infections (HAIs) 2015. <http://www.cdc.gov/HAI/surveillance/index.html>. Accessed October 23, 2015.
6. Centers for Disease Control and Prevention. Vital signs: Central line-associated bloodstream infections-United States, 2001, 2008 and 2009. 2011. <http://www.cdc.gov/mmwr/pdf/wk/mm60e0301.pdf>. Accessed October 23, 2015.