ICU PILOT of the PIVO Access Device for Inpatient Blood Draws

Inpatient blood draws are among the most frequent hospital procedures and critical to delivering informed and comprehensive care. It is a complex and invasive procedure, with high degrees of variability and proficiency across sites and between practitioners. The impact on patient experience is significant – especially for “frequent flyers” and for tough stick patients. Is there an opportunity for a more uniform and compassionate standard of care?
Blood collections in Griffin Hospital’s (Derby, CT – 160 bed community hospital) 14-bed Intensive Care Unit represent approximately 13.5% of the hospital’s 31,116 annual inpatient blood collections. On average, an ICU patient experienced 2-3 collections per day over a 4-day stay. Venipunctures (needle “sticks”) were performed 50% of the time, with over half of patients experiencing more than 1 stick to collect a sample. Patients receiving frequent blood draws across multiple days have the potential to feel like “pincushions” during their stay. Peripheral IV Catheters (PIVCs) were also used to obtain samples immediately upon PIVC insertion, however sample quality issues sometimes required that the sample be redrawn. And, subsequent PIVC draw attempts frequently resulted in challenges in obtaining a sample, likely due to the numerous complex reasons why IVs are suboptimal for blood drawing. Central and arterial lines were also used for blood draws in the ICU. However, the number of times a central line is “accessed” has the potential to increase the related risk of central line associated bloodstream infections (CLABSI). The Pilot aim was to assess, in a critical care setting, a new technology, PIVO™ for collecting blood samples via existing vascular access. The PIVO device enables practitioners to draw lab quality samples directly from the vein through an indwelling PIVC. This Pilot simultaneously assessed sample quality, ease-of-use, and user/patient satisfaction.

METHOD

A four-month ICU Pilot of PIVO (Velano Vascular, Inc. – San Francisco, CA) was initiated in February 2016 under the guidance of Griffin Hospital’s ICU Medical Director, Nursing Clinical Director, and ICU Nurse Manager. Product in-service/training and on-site clinical support was provided to ICU staff by Velano Vascular during initial weeks of the pilot and all activities were closely monitored by hospital administration and clinical leadership throughout the duration. Surveys and interviews were conducted with ICU nursing staff midway through the pilot to assess PIVO usage and practitioner satisfaction. Patient interviews were also conducted with those who had blood drawn using a PIVO device. Prior to pilot kickoff, baseline data was evaluated to assess ICU blood draw volumes, distribution, and frequency of current practices.

RESULTS

During the pilot period, 1,130 PIVO draws were conducted from ICU patients – representing approximately 80% of all blood collections in the unit. Assuming 40% of ICU patients are difficult venous access patients requiring at least two stick attempts, ICU patients avoided the pain and anxiety of an estimated 1,600 needle sticks. And, an estimated 550 of these would have occurred between the hours of 5:00 AM and 6:00 AM, disrupting critical sleep and healing.

"Once patients become aware that this alternative is available, you will not be able to keep it away from them."
—PATRICK CHARMEL, CEO, GRIFFIN HOSPITAL
On a scale of 1-5, with 5 representing extremely satisfied, nurses rated their overall satisfaction with PIVO a 4.5 and believe PIVO should be used with at least 85% of ICU patients. All nurse survey respondents agreed that PIVO draws provide a better experience for the patient. Patient and family member feedback was equally positive, reflecting an overwhelming appreciation for not having to continually be stuck for blood draws. In fact, two patients who received PIVO draws in the ICU later refused to have their blood drawn with a venipuncture needle upon transfer to another floor outside of the ICU.

Prior clinical studies of the PIVO device demonstrated that spurious hemolysis rates of PIVO samples were equivalent to those of a venipuncture collection. A subset of 318 samples drawn with PIVO during the pilot period were analyzed by Griffin Hospital’s Laboratory and Pathology Department for hemolysis. The resulting hemolysis rate was <1%, and the overall sample cancellation rate was 4%. As most of the ICU draws during the Pilot were conducted with PIVO, the cancellation rate (4%) was compared to the sample cancellation rate, during the same period, of the hospital’s “step down” floor (14%) which had a similar patient mix. Nearly 75% of nurse survey respondents “strongly agree” that

"PIVO helped to reduce the number of times we touched central lines and had to stop medication.”

—ICU NURSE MANAGER

PIVO can reduce reliance on Central Lines for blood draws, which research studies demonstrate pose real risks of central line-related bloodstream infections. Staff members at Griffin Hospital also noted other workflow efficiencies related to PIVO collections that reduced their need to pause critical central line infusions, like pressors or heparin, for specimen collection. A PIVO draw that reduced reliance on central lines saved time while also helping to avoid potential hypotension episodes created by pausing pressors and potential contaminated PTT samples when pulling from heparin infusing lines.

CONCLUSION
Collecting blood samples via PIVO through existing PIVC access resulted in extremely high levels of both nursing and patient satisfaction, superior quality samples, and important workflow efficiencies that offer the potential to establish a new and more compassionate standard of care for inpatient blood collection and vascular access.

"As a healthcare executive, how can you consciously not use this? It's less about should people use this, will people use this—it's if we really know it creates that level of change for a patient, that level of change for a staff member, how could we ever afford not to do this?"

—ALAN MANNING, COO, PLANETREE

4.5 out of 5
overall satisfaction with PIVO