Reducing Venous Depletion

Vygon USA
Constance Girgenti, BSN, RN, VA-BC
National Clinical Nurse Educator

Abstract

As we look at vascular access and the advances that have been made over the past several years to help clinicians improve patient outcomes there remains a challenge in providing care for patients that need IV therapy for longer than 3 days. The challenge is due to high failure rates, that we have come to accept, of peripheral intravenous catheters (PIV). These failure rates cause pain, can lead to infections and are costly to hospitals. PIVs are the most common invasive hospital procedure in the world and, unfortunately, have a failure rate of 35% to 50%.[1] In the United States there are 300 million PIVs placed in hospital annually.[2] PIV failures can lead to phlebitis, infiltration, occlusion and infections as well as, potentially, the insertion of an unnecessary vascular access devices, such as a PICC.[3] It is also import to understand that there is a direct correlation between patients that have a MRSA bloodstream infection and the number of "repetitive PIV insertion attempts prior to their infection."[3]

Methods

The Implementation of an Extended Dwell PIV to remediate the failure rates of short PIVs.[1]

- 22g peripheral intravenous catheter (small catheter to vein ratio)
- Thermosensitive polyurethane catheter (gentle to the vessel)
- Lengths of 4cm, 6cm 8cm and 20cm (more catheter in vein)
- Seldinger technique (higher first attempt success)
- Proper securement (reduces catheter migration)

Purpose

The implementation of this type of device by a small group of specialty trained clinicians can impact neonatal, pediatric and adult patient populations. The impact will directly: reduce the number of needle sticks a patient experiences during a hospital visit, reduce blood stream infections and costs related to device failures, and the escalation of device placement to PICC or other central venous catheters.

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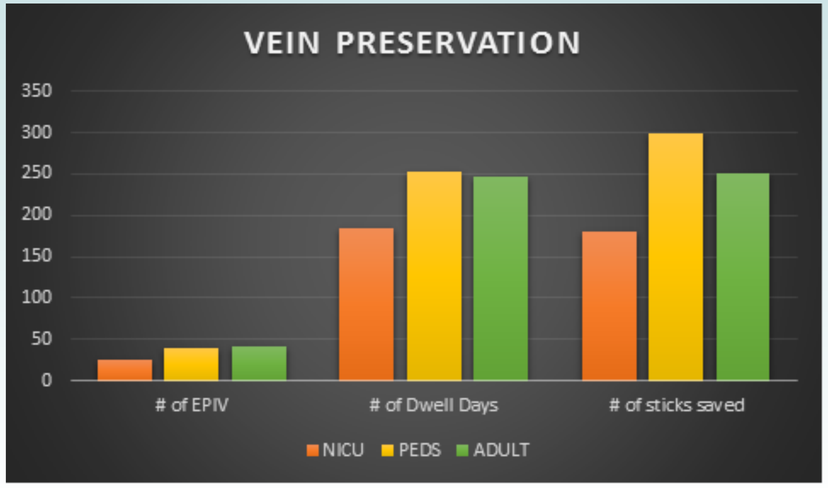
Results

During the trials at three hospitals (1-in the Midwest, a NICU, 2-on the East Coast, Peds & Adult) the goal was to improve upon the failure rate of 1-2 days of dwell with short PIVs. The goal at each hospital was to obtain over 6 days of dwell in each patient population. All 3 hospitals achieved longer dwells than the traditional short PIVs, thus reducing the number of needle sticks, costs related to failures, and subsequent escalation to central catheters and CRBSI.

Neonates	Pediatrics	Adults
25 EPIV	90 EPIV	42 EPIV
184 dwell days	519 line days	246 line days
87 PIVs for 184 dwell days	247 PIVs for 519 dwell days	117 PIVs for 246 dwell days
217 pokes for 87 PIVs (average # of pokes 2.5)	615 pokes for 247 PIVs (average # of pokes 2.5)	290 pokes for 117 PIVs (average #of Pokes 2.5)
180 pokes saved	500 pokes saved	250 pokes saved
$1,000 saved compared to short PIVs	$2000 saved compared to short PIVs	$8,526.00 saved compared to another EPIV



Discussion

Several articles and studies are beginning to look at what a vascular access device would look like that could fulfill this need. It is suggested that vascular access nurses consider a catheters gauge, length, material, insertion technique, insertion location and the type of stabilization/securement used to reduce repetitive PIV attempts and reduce infections. [1,3] The impact of having a catheter that is made of a thermosensitive polyurethane, placed using Seldinger Technique and longer in length can be realized for all patient populations, as evidence by this small sample size from 3 hospitals. Each hospital has reduced CRBSI since the implementation of a longer, thermosensitive catheter to obtain longer dwell days, instead of the current practice of repeated pokes and/or escalating to central catheters.

Conclusion

Failed PIVs and the pokes needed to restart them are a painful experience for patients of any size. As health care providers, we can no longer accept the failure of short PIVs. When there are options available to reduce pokes and costs, obtain longer dwell days, reduce CRBSI and avoid the escalation to central device, as well as improve the patient experience and overall satisfaction.

References

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