A Visual GPS to Access Difficult Vascular Anatomy

How does ultrasound-guided vascular access improve care and reduce costs? "Procedural ultrasound ... acts as a visual GPS that allows clinicians to map the patient’s blood vessels and identify the simplest, safest, and most cost-effective catheter site," says Matthew Ostroff, ARNP, a vascular access specialist and author of the St. Joseph’s report discussed above.

Ostroff reported that his hospital saved $1.1 million by substituting ultrasound-guided PIV in difficult-access patients for peripherally inserted central catheters (PICCs). At St. Joseph’s, PICCs take 40 to 45 minutes to insert, at a cost of $280 for supplies alone, versus 5 to 10 minutes to place a PIV line with a supply cost of $25 to $30. St. Joseph's program also yielded savings of $2.5 million by reducing length of ED stay and referrals to interventional radiology.
Similarly, a recent study at Texas Health Harris Methodist Hospital[v] reported that after its ED implemented a nurse-led ultrasound-guided vascular access program, the number of CVC and PICC placements due to problematic PIV access fell by 74%, resulting in annual savings of $200,000. Other investigators have reported PIV success rates of up to 100%[vi] with ultrasound guidance, while fewer sticks and faster care, understandably, also significantly increases patient satisfaction.[vii]

PIV as a Safer Alternative to High-Risk Central Lines

Particularly for PIV catheterizations in critically ill or unstable patients, speed and a high rate of first-pass success are vital for optimal outcomes. However, in about 35% of patients who present to the ED, obtaining PIV access is difficult, particularly if traditional landmark or palpitation techniques are used, according to a recent meta-analysis.[viii] That can result in multiple failed attempts at line placement, causing patients to suffer pain, delays in care, and increased risk for infection.

However, PIV placement in difficult-access patients is nearly four times more likely to be successful if ultrasound guidance is used, compared to traditional techniques, the meta-analysis found. Other research has demonstrated that ultrasound guidance can often help patients with problematic PIV access due to such factors as obesity, chronic illness, a history of IV drug abuse, vascular pathology, or other conditions avoid central lines—and their risks, which include arterial puncture, bleeding, thrombosis, pneumothorax, and bloodstream infections. For example, in a recent study of difficult-access patients, ultrasound-guided PIV eliminated the need for central lines in 85% of cases. Participants were tracked for seven days and had zero complications.[ix]

Multiple peer-reviewed studies highlight the powerful role that ultrasound guidance can play in helping prevent medical harm from needle-based procedures performed to help patients heal. As Medicare intensifies the focus on improving hospital performance, and ACEP advocates the one-stick standard, we owe it to our patients to adopt the safety practices that have been shown to lead to superior outcomes.

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