

# ULTRASOUND-GUIDED VASCULAR ACCESS PROGRAM SAVES ST. JOSEPH'S \$3.5 MILLION

Written by Matthew Ostroff, ARNP | February 10, 2017

In 2016, the American College of Emergency Physicians (ACEP) issued a policy statement advocating a new safety goal for vascular access: the "one-stick standard."

To help clinicians achieve it, ACEP recommends using procedural ultrasound, performed at the bedside, for placement of central venous catheters (CVCs) and peripheral intravascular (PIV) lines, citing such benefits as "improved patient safety, decreased procedural attempts and decreased time to perform many procedures in patients whom the technique would otherwise be difficult."<sup>1</sup>

Experience at St. Joseph's Healthcare System, a 700-bed hospital in Paterson, N.J., bears this out. Since the February, 2014 launch of our ultrasound-guided vascular access program, we have seen striking improvements in the safety and quality of care for patients ranging from 2-pound premature infants to adults weighing up to 500 pounds. In addition, the program has resulted in a cost savings of \$3.5 million to date, using a 3-person team of vascular-access specialists and portable ultrasound machines at the bedside.

How did we achieve these clinical and financial outcomes? Here is a closer look at our ultrasound-guided vascular access program and lessons learned.

## Ultrasound Guidance at the Bedside Cuts Costs by Speeding Up Care

Two interrelated factors account for more than \$2.5 million of the cost savings our program has delivered in its first two years. First, using procedural ultrasound at the bedside avoids the need to send patients to interventional radiology for such vascular access procedures as peripherally inserted central catheters (PICCs), freeing up our radiologists for other procedures, such as angioplasty. Use of ultrasound guidance, which provides direct, real-time visualization of the target vessel and surrounding structures as the needle is advanced to the desired destination, has enabled our team to achieve a 96.4% first-pass success rate, thus accelerating the care of critically ill or unstable patients.

Improved efficiency and faster vascular access has also resulted in additional cost savings by shortening length of stay in our emergency department (ED). Many commonly used therapies--ranging from administering fluids, blood products or medications to resuscitation, hemodialysis and hemodynamic monitoring--cannot be initiated until a line has been successfully placed. Similarly, vascular access is often an prerequisite

for transferring ED patients to other departments for additional treatment, such as surgery, the cardiac catheterization lab or the critical care unit.

## Ultrasound-guided Peripheral IV is a Highly Cost-effective Alternative to Central Lines

Over the past two years, our program has also saved nearly \$1 million by through one simple, but extremely important change in the type of catheters used for patients with problematic vasculature due to obesity, chronic illness, chemotherapy, IV drug abuse or other conditions. Without ultrasound guidance, such patients--sometimes known as "difficult sticks"--often end up with central lines, because clinicians find it difficult or even impossible to achieve PIV. Prior to the advent of our ultrasound program, such patients often received PICCs, which take 40 to 45 minutes to perform at cost of \$280 for supplies alone at our center.

Procedural ultrasound, however, 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. That means patients with difficult access can often receive PIVs, which take 5 to 10 minutes with a supply cost of \$25 to \$30, instead of costly and often riskier PICCs. Since implementing ultrasound-guided PIV at our center, we have reduced the use of central lines, which can have complication rates of up to 15% if inserted blindly<sup>2</sup>, by 40%.

## Ultrasound Guidance improves Patient Safety, Comfort and Satisfaction

Recently, two children with very different disorders--a two-year-old cancer patient and a very ill, dehydrated 10-year-old in sickle cell anemia crisis (an extremely painful and in some cases, potentially life-threatening condition)--were transferred to St. Joseph's for the same reason: Clinicians at other local hospitals were unable to achieve vascular access, despite 8 attempts on each child. Understandably, both children were exhausted and crying after having been jabbed over and over.

Picture the relief of these patients--and their parents--when ultrasound was used to locate an accessible vein and guide accurate needle placement, on the first try, so these seriously ill children could receive the treatments they urgently needed. These stories--and many similar experiences with other chronically ill children at our hospital--highlight the true value of using ultrasound guidance to achieve the one-stick standard: providing safe, successful care, with optimal site selection, for the patients who need it the most.

## **ULTRASOUND-GUIDED VASCULAR ACCESS PROGRAM SAVES ST. JOSEPH'S \$3.5 MILLION** (CONTINUED)

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### **References**

1 *Emergency Ultrasound Imaging Criteria Compendium. Ann Emerg Med, Vol. 68 , Issue 1 , e11-48. Available at [http://www.annemergmed.com/article/S0196-0644\(16\)30096-8/abstract](http://www.annemergmed.com/article/S0196-0644(16)30096-8/abstract). Accessed on January 12, 2017.*

2 Feller-Kopman D. *Ultrasound-Guided Internal Jugular Access: A Proposed Standardized Approach And Implications For Training And Practice. Chest. 2007;132(1):302-309.*

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