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Expanding the Role of a Vascular Access Team:

Incorporating CVCs and Arterial Lines into Your Service Offerings

Three Case Studies

Introduction

As the U.S. healthcare system continues to evolve, an opportunity has emerged for hospitals to:

- Improve the services they offer patients
- Enhance their reputations as quality care providers
- Reduce the cost of providing care

All these advantages become possible when hospitals support their non-physician vascular access staff—including physician assistants (PAs), nurse practitioners (NPs), registered nurses (RNs), and respiratory therapists (RTs)—in expanding their scope of practice to place central venous catheters (CVCs) and arterial lines.

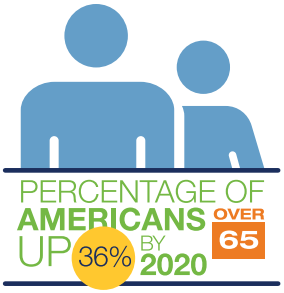
Vascular access is already a recognized specialty within many hospitals, with skilled non-physicians banded together under such names as vascular access teams, PICC teams and IV teams. These personnel are proficient in ultrasound use, sterile technique, catheter placement, and tip location. They are the facility's recognized experts in the placement of PICCs, midlines and peripheral IVs.

Most states already permit non-physicians to insert CVCs and arterial lines. If hospitals take advantage of this option, their vascular access teams can broaden their services and free up physicians to focus on other tasks and medical procedures.

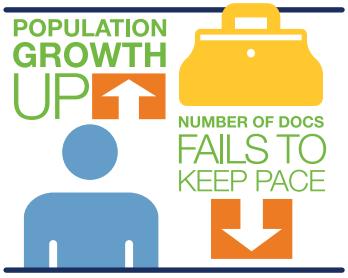
This white paper is designed to help individual non-physicians and vascular access teams take the necessary steps to begin placing CVCs and arterial lines, in states where it is within their scope of practice. The process may be initiated by the employing institution or by individual non-physicians. You will see examples of both scenarios in the case histories below.

When non-physicians expand their practices in this way, they bring value to their hospitals and themselves by preparing for the inevitable shifts in the healthcare landscape. Some of the factors in our healthcare system that make this scope of practice expansion both timely and appropriate are discussed in the white paper.

A Changing Healthcare Landscape



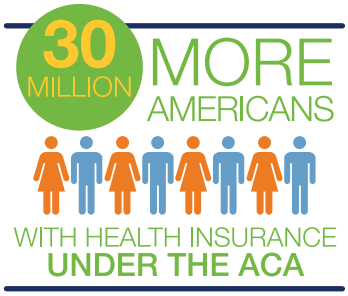
Aging population. By 2020, the U.S. Census Bureau projects that the population of Americans over the age of 65 will increase by 36%.[1] This is the segment of the population with the greatest medical needs, including vascular access. As these numbers increase, so does the demand for physician services.



Growing population. The general growth in population is expected to create an even greater need for physicians than the growth in the part of the population that is aging—perhaps more than three times as much, according to one study.[2]

Physician shortage. The number of physicians, while growing overall, is not increasing fast enough to keep up with the increasing need for medical services. For instance, the 36% increase in older Americans is likely to be met by only a 7% increase in the physician population by 2020.[1] Add to this the fact that the physician workforce is aging, with nearly one-third of all physicians active in 2010 expected to retire by 2020.[1]

Result? The Association of American Medical Colleges (AAMC) predicts that during the current decade alone, there will be a shortage of 46,000 surgeons and medical specialists.[1]



More patients with access to healthcare. The Patient Protection and Affordable Care Act (PPACA), known popularly as the Affordable Care Act (ACA), is expected to increase the number of Americans with health insurance by about 30 million, according to the Congressional Budget Office.

Put all of these facts together and you have a perfect storm: more patients with pronounced medical needs and fewer physicians to attend to them.

Hospitals can help address this impending provider gap—and add value to the healthcare economy—by having non-physician vascular access teams place CVCs and arterial lines. Consider that the national shortage of physicians means there are greater demands on an individual physician's time than ever before. Note also that some 5 million CVCs and 8 million arterial lines are placed in U.S. hospitals every year.[3,4] If physicians were relieved of the obligation to insert these lines, it would free considerable time for them to perform tasks for which they alone are qualified.

Although physicians receive training in IV line insertion in medical school, it is not their primary focus, nor is it a skill set that most of them practice regularly. In addition, Medicare reimbursement to physicians for central venous access has dropped substantially since about 2000.[5] Many physicians would be happy to turn this task over to highly trained non-physicians in the vascular access specialty, if they were confident that patient outcomes would not be compromised.

A Case for Change

The very fact that most states allow non-physicians to perform CVC insertions should reassure physicians and hospital administrators that quality of care is not an issue. There are other reasons, as well, to believe that patient care could actually improve if vascular access specialists inserted CVCs and arterial lines. Consider the following:

Greater availability of non-physicians. When a patient needs a CVC or arterial line, care may be delayed until a physician becomes available to do the procedure. Non-physicians are generally more available and more involved in direct patient care than are physicians. If non-physicians insert the line, IV therapy may be delivered in a more timely manner leading to potential reduced length of stay.

The average wage for an anesthesiologist ranges from about $65 per hour to more than $90 per hour; in contrast, pay for a vascular access specialist can range from $20 to $60 an hour.[9]

Experience with ultrasound guidance. Line placement performed with ultrasound guidance tends to result in fewer attempts to achieve success and in fewer complications. This means greater comfort and safer care for the patient, at lower cost. Many non-physicians have become skilled at ultrasound guidance in conjunction with placing PICCs and peripheral IVs. This skill is directly transferable to CVC and arterial line placement.

Reduced cost to insert the line. The costs associated with non-physicians inserting a line are generally lower than physicians. For example, the average wage for an anesthesiologist ranges from about $65 per hour to more than $90 per hour; in contrast, pay for a vascular access specialist can range from $20 to $60 an hour.[6]

Training of residents. At many facilities, administrators worry that allowing vascular access teams to place CVCs and arterial lines will take a valuable training opportunity away from residents. But the reverse is actually true. Permitting vascular access specialists to insert CVCs and arterial lines creates an opportunity for residents to learn vascular access from people who are specially trained in device selection, ultrasound, sterile technique and the overall procedure.

Hospitals gain by improving the quality of the vascular access care they deliver to patients. This makes for more strategic use of physicians' highly compensated time.

Increased value to the hospital. Vascular access teams themselves benefit by expanding their practice to include CVC and arterial line placement, because they add to their skill set and make themselves more valuable to their employer. Hospitals gain by improving the quality of the vascular access care they deliver to patients. This makes for more strategic use of physicians' highly compensated time and allows insertions to be performed at a lower cost.

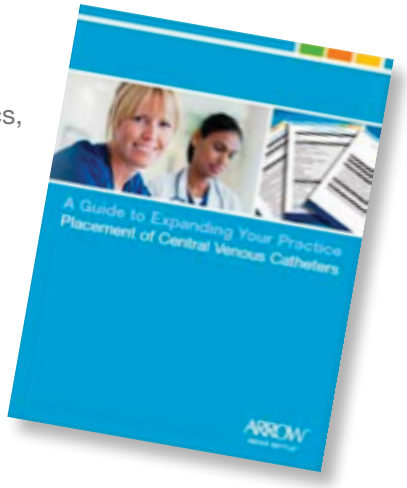
Resources for Change

Teleflex offers several resources to assist non-physicians in adding these new skills.

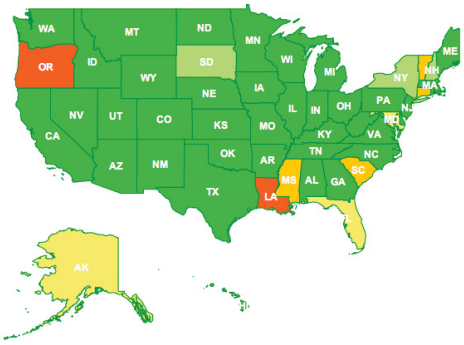
A Guide to Expanding Your Practice: Placement of Central Venous Catheters*

This tool offers a road map to expanding a non-physician's scope of practice. It can be downloaded free of charge from **arrowjacc.com/vas**. Among its many topics, the guide covers how to:

- Identify fears and anxieties about expanding one's scope of practice
- Get support from various stakeholders including the vascular access team, physicians, medical staff and administrative staff
- Build a business case for the expansion
- Track relevant data
- Develop relevant policies and procedures



*This tool is also applicable to arterial line placement.



Interactive State Scope of Practice Map

Does your state currently allow nurses to place CVCs? You can quickly find out by checking the online map available at **arrowjacc.com/vas.** Pass your cursor over your state to get more detailed information.

Hands-On Training

To receive training in CVC or arterial line placement through Teleflex, go to **arrowjacc.com/vas.** You can receive the training either at your facility or at a licensed training center.

Documented Success

What follows are three case histories of vascular access professionals who have gained competency and are now regularly placing CVCs and/or arterial lines in their hospitals.

CLINICIAN: Jim Bryant, RN, VA-BC

HOSPITAL: Chesapeake Regional Medical Center, Chesapeake, VA., 310 beds

Jim got his start placing CVCs while part of an IV team at a hospital in Wichita, Kan. in the mid-1990s. There he learned to place PICC lines in the upper extremity site using ultrasound guidance.

He worked the night shift and often assisted emergency department physicians when they placed IV lines. One of those physicians would call Jim for help when facing a difficult CVC insertion in the internal jugular (IJ) site. He recognized that Jim's ultrasound skill was a better, safer approach to the insertion than the traditional "blind stick" technique the physician had learned in medical school.

As they worked together, the two men shared their skills with each other. Soon, Jim was able to place CVCs in the IJ using ultrasound guidance. The physician began calling Jim to place the lines in the emergency department once or twice a month, with the doctor present during the procedure.

Jim was hired to start a vascular access department in 2006. Although it was a one-person department for Jim's first year there, the vascular access team had grown to three people by 2008, including one experienced nurse besides Jim and one trainee. They placed PICCs and difficult PIVs and also did troubleshooting on lines when requested by various hospital units.

In 2009, Jim was assisting an intensivist with a CVC placement and suggested that his team start placing CVCs in the IJ and also radial arterial lines—in both cases, with ultrasound guidance. The intensivist agreed that the proposal made sense, since the team members—not the physicians—were the ones with the ultrasound experience.

Encouraged, Jim approached other intensivists at the hospital with the same idea. Three of the doctors agreed to oversee the training of Jim and the other experienced nurses to confirm their competency. Additionally, both nurses attended a CVC insertion course at a conference. The elevation of the team's abilities and duties was under way.

Since that time, Jim's vascular access team has grown to seven members with five actively placing CVCs.

Since that time, Jim's vascular access team has grown to seven members with five actively placing CVCs. As of this writing, the two other team members are completing their training to do the same. Together, the team places 25-50 CVCs per month. All seven team members are trained in, and actively placing arterial lines, as well.

The team's rate for IV-associated infections is zero—underlining the improved patient safety that is possible when hospitals support vascular access specialists in placing central and arterial lines. Inspired by the team's success, the hospital hosted a workshop on CVC/arterial line insertion that was attended by caregivers from around the country.

Jim has several recommendations for those who would follow his team's footsteps.

First, he says, non-physicians should have certain knowledge and abilities in place before expanding into CVC and arterial line insertion. "On the technical side, I think you need to have a strong ability to track the needle tip, a good understanding of vascular anatomy, a good awareness of what can go wrong, and the knowledge of what to if an undesired event happens," he says. "On the personal side, you need good critical thinking and perhaps most importantly, the focus and commitment to avoid mistakes and protect your patient."

"Once you have those bases covered, find a physician champion who knows your skill and trusts your ability. And then don't be shy about asking for their support. I wasn't, and it transformed our vascular access team and line placement at Chesapeake Regional Medical Center."

CLINICIAN: Rebekah Limato, B.S., RRT

HOSPITAL: Mesa, AZ, 340 beds and 111 beds

In 2010, the hospitals switched from a nurse-centered vascular access team to one that also included respiratory therapists. In 2012, the hospitals had the team expand its practice—which had previously been restricted to PICCs and PIVs—to ultrasound-guided CVCs and arterial lines.

To team member Rebekah Limato, the change was not a moment too soon. "I felt I'd been stagnant in my career," she says. "So building this skill set and expanding our role was very exciting for me."

Her hospitals had good reasons for moving in this direction. First, doctors had limited time available to insert CVCs and arterial lines. Before the change was made, the availability problem led to delayed placements and extended patient length-of-stay. They were also anxious to use doctors' time more efficiently—especially in the emergency room and the ICU. Meanwhile, physicians were eager to reduce their catheter placement workload. Handing off this task to the vascular access team just made sense.

The health system of which the hospitals are a part supports the scope-of-practice expansion by offering its own CVC insertion course, taught by Gregory Chu, M.D., staff intensivist in Phoenix. After studying the technique and related topics such as infection prevention, clinicians must competently place 25 lines at an insertion site (IJ, subclavian) before they are approved to place CVCs in a patient at that site.

Doctors had limited time available to insert CVCs and arterial lines.

Rebekah's team, now called the Vascular Access Team, has largely focused on IJ insertions rather than the more complication-prone subclavian procedures, which are still performed mainly by the hospitals' physicians.

Those IJ insertions by the team have gone extremely well. The team has a very good placement success rate and as of this writing, an exemplary record going back to early 2012: no pneumothorax incidents, no bleeding, no arterial cannulation, no vessel lacerations and—most importantly—no CVC-related bloodstream infections. The team will soon be expanding its duties to include temporary dialysis catheter placements.

While expanding its practice has been a relatively smooth ride for the CVC Line Team, Rebekah recalls that some physicians resisted early on. Team members overcame that by improving their skills and building stronger relationships with the medical staff.

Rebekah offers a number of other tips to clinicians and vascular access teams who hope to expand their practice in similar ways.

"What we do is a big responsibility and a privilege," she says. "It's important to never lose sight of either of those things." Part of that responsibility, she notes, is continually updating and fine-tuning your line assessment skills so you can determine for each patient which line is most appropriate and has the least risk of infection.

"Don't just be task-oriented," she urges. "Be a dedicated professional. We can't forget for a minute that patients' health and lives are at stake."

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CLINICIAN: John Fritts, RN, VA-BC

HOSPITAL: Wichita, KS, 700-plus bed system

John Fritts and his colleagues on the IV Therapy team found that placing CVCs was a natural outgrowth of their experience in placing PICCs with ultrasound. Once they learned to place PICCs in the IJ, they knew that CVC placement in the IJ was an obvious next step.

In 2008, John took a CVC insertion course. Other team members obtained similar training. Getting permission to do CVC insertions at their place of work was a somewhat bigger challenge, however—especially when some physicians pushed back against the idea.

Fortunately, various team members had good relationships with physicians who were more accepting of the concept. The nurses recruited them as champions. In addition, one team member was on very good terms with some of the hospital decision makers. That, too, was helpful in pushing the process forward.

The team's big break came with renal patients. The hospital had a renal transplant unit and with those patients, John notes, you want to make sure to preserve the veins in their arms. Therefore, a CVC placed in the IJ is a better option than a PICC in most cases. Whenever an IV Therapy team member was able to suggest to a physician to order a CVC instead of a PICC, the nurse had the opportunity to request permission to insert the line, too. The case was not hard to make.

"If you've got a surgeon whose specialty is transplanting organs and he's being asked to place lines, that's not the best use of his time and expertise, from his standpoint and the hospital's," John notes. "Once we demonstrated our competence to the doctors, it became obvious that we could free them up to do other things. That really got the ball rolling."

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As at other facilities described in this document, the IV Therapy team has compiled an excellent safety record to date. There have been few insertion-related infections, no incidents of pneumothorax, and a near-zero rate of other complications.

John has advice to offer on how vascular access teams at other hospitals should proceed if they want to expand their practice into CVC placements.

Start by recruiting physician champions, he says. "Yes, you have to go through the proper channels administratively. But if that's all we had done, it would have taken longer," he notes. "So you need a physician champion and better yet, two or three. Our champions were able to use their relationships with administrators to nudge the process along, person to person.

"If you show them that your primary concern is patient outcomes and you want their help, they'll be on your side. For example, suggest to them that if nurses can place the lines, patients won't have to wait until a doctor is available."

It also doesn't hurt to show physicians how you can make their lives easier, John says. "Point out that if you place the lines, they can avoid a late night call when they're with their family."

Once you have a solid physician champion or two, you're well on your way to making nurse-placed CVCs standard procedure, John believes. "If you show your stuff to one doctor, they'll mention it to their colleagues, and those doctors may come to you to request line placements."

Finally, John has some technical pointers: "Before you take on CVC insertion, you should be honest with yourself about your own readiness, personally and knowledge-wise. You should be a highly motivated, experienced professional who doesn't need much supervision. In particular, you need to be skilled at PICC placement and PICC troubleshooting, without supervision."

Summary

Several factors have converged to favor expansion of vascular access practices of trained non-physicians to include CVC and arterial line insertions at their institutions. There are numerous advantages for the clinicians, their employing hospitals, and the national healthcare system as this transition occurs.

Non-physician inserters do, of course, need to have the appropriate background and professional orientation for this change. They also should be prepared to overcome potential administrative challenges. Organizations may present barriers to change even if the change is in the institution's best interest.

First and foremost, the expansion of practice should be built on a solid foundation of vascular access skills and general clinical aptitude. If you are currently a member of a vascular access team and want to start placing CVCs and arterial lines, considering the following:

Questions you should be able to answer yes to:

- ☐ Am I a good critical thinker about clinical issues?
- ☐ Am I meticulous about technique and adherence to policies and procedures?
- ☐ Is the patient's welfare always my first priority?

If you are able to answer yes to those questions, are you also competent in the following areas?

- ☐ First-rate ability to place PICCs without supervision.
- ☐ Ability to place PICCs without a tourniquet.
- ☐ Ability to troubleshoot PICCs, without supervision.
- ☐ Ability to track the needle tip throughout the insertion process, using ultrasound guidance.
- ☐ Excellent knowledge of vascular anatomy.
- ☐ Knowledge of indications and contraindications for CVCs and/or arterial lines.
- ☐ Knowledge of complications of CVC and/or arterial line insertion and how to treat them.
- ☐ Knowledge of standard central line bundles and the rationale for each item such as barrier precautions, chlorhexidine skin prep, safer vs. riskier insertion sites, prompt removal of unnecessary lines, and so on.

For more information on non-physicians' qualifications for insertion of CVCs and arterial lines, see the Association for Vascular Access position paper titled "Cannulation of the Internal and External Jugular Veins by Registered Nurses and other Qualified Healthcare Professionals," available at **http://bit.ly/1k2PUq0.**

If you have further questions about the expansion of non-physicians' roles in CVC or arterial line placement, other expansions of scope of practice, or related training, please contact your local Teleflex vascular access sales representative. You can also visit **arrowjacc.com/vas** for more resources.

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