

# Placement Precision: Where to Start

Choosing the Right Catheter Insertion Site for Optimal Dwell



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## The Importance and Preference of Site Selection

Gaining vascular access is the critical first step in ensuring that medication is delivered as prescribed, but keeping that access reliable throughout treatment is equally critical. While you might first focus on which catheter to use, where you place that catheter plays a significant role in clinical success. Many of us strive for a “one stick” hospitalization—even with peripheral IV catheters—and the successful dwell of the catheter often depends on choosing the right anatomical site.

A walk through the hospital likely reflects an overrepresentation of peripheral intravenous catheters (PIVs) in patients’ hands or antecubital fossa (ACF), unless quality improvement initiatives have specifically addressed this or vascular access specialists are routinely involved with PIV placements.<sup>1</sup> The use of non-preferred sites may arise from a lack of awareness of the recommended guidelines and associated complications or a need for further skill development among staff.

Additionally, using veins in the trunk is not supported by evidence for safety, and lower extremity access points in adults should remain a last resort for peripheral IV access.

For most adults, the forearm is considered the preferred site for IV access. There are good reasons for this: the forearm tends to have fewer complications like infiltration and phlebitis, it’s easier to secure and stabilize the device, and it usually results in less pain and a longer dwell time.

## Risks and Guidelines for Non-Preferred Sites

So why is the ACF so problematic? To begin, the site is linked to an elevated risk of infection, particularly from *Staphylococcus aureus*.<sup>2,3</sup> Furthermore, although the ACF has often been chosen for its easy access, it’s not actually recommended for routine use. Guidelines advise avoiding areas of flexion, even specifically stating “avoid the antecubital fossa,” and suggest considering extra precautions—like using an arm board or split—if those areas must be used.<sup>4</sup>

The Canadian Vascular Access Association guidelines take it a step further, directing that devices placed in flexion points be treated like emergent IVs and removed within 24-48 hours.<sup>5</sup>

The Australian Management of Peripheral IV Catheters Clinical Care Standard also encourages removing cubitally placed catheters as soon as possible.<sup>6</sup> Consider reviewing the quality metrics included in this standard for helping to quantify and understand current practices.

A common misunderstanding that drives excess use of the ACF is for patients who may be undergoing imaging procedures such as CT angiography studies. Historically, radiology departments have insisted on the use of ACF, but often without formal policy mandating this practice.

The American College of Radiology’s Manual on Contrast Media can serve as a good reference for discussion between vascular access, emergency room, and radiology clinicians on this matter. Notably in the latest 2024 update, there is no preference given to the ACF over a large forearm vein allowing

healthcare teams to advocate for site selection that can improve overall vascular access success without compromising the quality of the imaging study.<sup>7</sup>

## Special Considerations for Specific Patient Populations

There are some notable exceptions to the “forearm first” recommendations, though. For short-term devices where the dwell time is less than 24 hours, veins in the hand may be considered. This doesn’t mean that the forearm cannot or should not be used in these patients, only that selecting the veins of the hand may also be an acceptable choice. Complication rates in this site increase with length of dwell, so the risk is relatively lessened when dwell times are brief.

The other significant consideration is patients who may progress to needing an arteriovenous graft or fistula for hemodialysis.<sup>4</sup> According to INS Standards and the KDOQI guidelines, the hand actually becomes the preferred site in these cases, with specific recommendations that the forearm and upper arm be avoided.<sup>4,8</sup>

Extensive staff education may be required to help achieve this, as these patients are often cared for throughout the organization rather than confined to a specialized care unit, and the need for vessel preservation begins relatively early in disease progression.

For pediatric and neonatal patients, there are a few more options. The veins in the foot might be considered, as long as patient activity won’t interfere. However, it’s best to avoid hands, fingers, and thumbs, and scalp veins should only be used as a last resort when no other options are available.

It’s essential to ensure institutional policies regarding documentation for any non-preferred site selection are adhered to. Auditing practices through direct observation or reviewing available reports within your EMR can help identify specific units that may benefit from quality improvement efforts focused on optimal site selection and its impact on patient outcomes and catheter dwell time.

## Empowering Clinicians for Better Outcomes

No matter the patient population, it’s important to empower frontline staff to identify difficult intravenous access (DIVA) patients early and refer them to specialists if there aren’t enough visible or palpable veins. This can help enhance vessel health and preservation by decreasing failed attempts and optimizing available options.

There are a variety of tools (DIVA scales) that have been published for specific patient populations that can assist with the assessment, but each organization should plan to identify what the appropriate steps are for escalation when staff identify a patient whose access needs are beyond their own competence and confidence for successful insertion.<sup>9,10,11,12</sup>

Careful site selection is crucial to ensuring the success and longevity of IV access. By choosing the appropriate site, we can reduce complications, enhance patient comfort, and improve overall treatment outcomes. Whether dealing with common placements or special patient populations, understanding and prioritizing the right site can make a significant difference in patient care. As healthcare providers, our commitment to precision in site selection is essential for delivering safe, effective, and patient-centered care.

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