ASK THE EXPERTS

Dialysis Access Maintenance in 2025: What Factors Drive Decisions?

Successful access management relies on durability, consideration of current and future access needs, timely access to care, and prioritization of the patients' preferences and goals.

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1 Desire to achieve a durable result.

The first factor that drives my decision regarding dialysis access maintenance is the desire to achieve a durable result so the patient will not need to return frequently for more procedures. This requires some knowledge of recent high-level clinical trial data. Although many of the newer devices for maintenance of dialysis access confer better patency results, they are nearly always more expensive than using a conventional percutaneous transluminal angioplasty (PTA) balloon. However, the costs of these newer dialysis maintenance devices are generally much less expensive than other devices and implants in the cath lab, such as aortic endografts, implantable pacemakers, left atrial appendage implants, and percutaneous aortic valves. Fortunately, I have a very supportive hospital administration that is focused on achieving better patient outcomes, so I am not constrained in deciding the best strategy to maintain hemodialysis access. I should also note that recent economic models for covered stents and drug-coated balloons (DCBs) have demonstrated that even though these devices are more expensive to purchase than conventional PTA catheters, the overall economic impact is typically cost neutral or better for the payor and center, while also improving outcomes for hemodialysis patients.

This may not be the case for decision-makers in an outpatient procedural setting not affiliated with a hospital, especially when there are palpable cost containment pressures from the center. Three factors are at play in the outpatient "access center" setting that may negatively impact optimal decision-making. First, the purchase of any expensive device or strategy may have a significant negative impact on the center's profitability. Second, there is a concern that adjunctive technologies may increase the length of a procedure, reducing throughput. Third, if the time between interventions is lengthened by use of a device or strategy, then a patient may not return to the center as frequently. This will have a negative impact on the center's financials. One example is the use of DCBs that have shown longer periods of time between interventions. This requires initial vessel prep with a conventional PTA, followed by use of a DCB, which extends the length of the procedure by at least 5 to 10 minutes. Of course, DCBs are also much more expensive than conventional PTA balloons and are not specifically reimbursed beyond payment for angioplasty.

Therefore, using a DCB in certain settings may be discouraged, even though data suggest that it may be a better strategy than conventional PTA in some cases.

2 Longitudinal results of prior interventions.

Beyond achieving a more durable result from dialysis access maintenance procedures (my first and most important driving factor), I look at the longitudinal results of prior interventions. If a patient is returning frequently with the same problem, then a different strategy is needed. I turn to the oft-quoted saying, "Insanity is doing the same thing over and over again and expecting different results."

3 Patient preference.

My last factor is related to what the patient wants. Many patients in my practice know that there are options for dialysis access maintenance: revision surgery, creation of a new hemodialysis access, placement of a peritoneal dialysis catheter, or simply abandoning a failing hemodialysis access with ongoing use or placement of a catheter. I recently had a patient in their 80s who was willing to try a percutaneous arteriovenous fistula (pAVF) but didn't want to have multiple procedures. He had a hemodialysis catheter that had only been changed once in 3 or 4 years and was working well. I said that I would try to limit the number of procedures and then successfully created a pAVF. Unfortunately, it wasn't ready for hemodialysis, so I brought him back for a second procedure. That didn't work well enough, and it was clear he would need a third procedure. He declined and said he was fine to continue with his catheter, which is what we agreed upon, and he continues to do well.

To summarize, I select the best device and strategy that gives the most durable result based on high-level clinical trial data, review the prior series of procedures to see if a new approach may be needed, and listen to my patients when I feel that they are informed and understand their options.

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1 Prioritize the patient's lifetime access journey.

When considering dialysis access maintenance, one should consider the primary message of the recently revised Kidney Disease Outcomes Quality Initiative (KDOQI) guidelines in 2019: "The right access, in the right patient, at the right time, for the right reasons."[1] This mantra is a guide I use to consider what interventions might benefit the patient over their entire lifetime access journey. This has implications for timing and use of different devices, as well as the associated patency and potential impact on future accesses for the patient. There are algorithms in the KDOQI guidelines to assist in decision-making, but they were written before recent relevant clinical trials

2 Consider results of level 1 studies for an individualized approach to management of dysfunctional access.

With the above in mind, within the last decade we have seen a number of level 1 studies published for DCBs and stent grafts that have changed the management of dysfunctional accesses. Specifically, prospective randomized studies for the Lutonix (BD Interventional) and In.Pact (Medtronic) DCBs demonstrated superior outcomes over PTA in autogenous AVFs. Additionally, studies of the Covera stent graft (BD Interventional) and Wrapsody cell-impermeable endoprosthesis (Merit Medical Systems, Inc.) have shown statistically significant improvement in patency over PTA in AVFs. Both devices were also studied prospectively for arteriovenous graft (AVG) stenosis and demonstrated superior outcomes to benchmark PTA outcomes. Although all were studied as primary intervention devices, my personal preference between them and PTA remains individualized, based on each patient's access issues and prior intervention outcomes.

3 Focus on what may provide a more durable solution for the patient.

Finally, it's important to focus on what we can do as endovascular specialists where, for example, an attempt at percutaneous creation of a new dialysis access in the

setting of occluded outflow when considering a durable functional access. I also consider if surgical creation of a new access or surgical revision of the existing access can provide a more durable solution for the patient; if so, I have a discussion with my nephrology and surgery colleagues regarding these options.

Although most interventions for dialysis access maintenance are routine, I always prioritize what's best for the patient and their access, taking into account their overall access situation, what devices, if any, may provide a more durable solution, and whether surgery offers a potentially better option.

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1 Patient-specific clinical considerations.

In 2025, decisions around dialysis access maintenance are guided by three critical factors: patient-specific clinical considerations, proactive intervention, and patient-centered communication. First, patient-specific clinical considerations are at the heart of every decision. Every patient's vascular access journey is shaped by their overall health, vascular anatomy, comorbidities, and life expectancy. It's not just about finding a vein—it's about understanding a patient's life, goals, and long-term needs. For younger patients, this means delaying the need for central venous catheters when possible and preserving future sites to avoid running out of options too soon. For older or more complex patients, the focus may shift toward maximizing current access function without prematurely exhausting available sites. For patients who aren't ideal surgical candidates due to cardiac risk, options like endovascular AVF creation performed under conscious sedation can offer a safer alternative, avoiding the need for general anesthesia and complex cardiac clearance. These decisions should reflect the patient's long-term dialysis journey, recognizing that each access is a critical resource that should be preserved whenever possible rather than sacrificed for short-term convenience.

2 Proactive intervention.

Proactive intervention has become essential for maintaining long-term access patency. With today's rapidly evolving technology, we can now shift from reactive to truly proactive care. Innovations such as wearable sensors using thermal anemometry can detect subtle changes in blood flow, providing early warnings of potential access failures and enabling timely interventions. Additionally, the integration of artificial intelligence and machine learning algorithms allows for the analysis of vast amounts of patient data, identifying patterns and predicting complications before they occur. This approach reduces the risk of prolonged catheter dependence, minimizes costly hospitalizations, and significantly improves overall patient outcomes. It's about anticipating problems before they arise, not just reacting to them.

3 Patient-centered communication.

Patient-centered communication is critical. Every patient's relationship with their access is deeply personal. For example, for many patients, the fear of needles remains a significant barrier. Although this fear may not directly impact the technical success of dialysis, it can lead to prolonged catheter dependence. Compassionate, collaborative conversations, combined with patient education and emotional support, can help patients overcome this barrier, empowering them to take a more active role in their care. Additionally, ongoing, open dialogue is essential when making critical decisions, like choosing between an AVF and an AVG or selecting the most suitable access site based on a patient's lifestyle and physical needs. These conversations not only align medical decisions with patient goals but also build trust, improve adherence, and enhance overall quality of life.

Although other factors such as cost of care and system constraints can influence decisions, these three factors remain at the heart of clinical decision-making in dialysis access maintenance. Ultimately, successful access management in 2025 relies on truly understanding each patient's unique needs, being proactive about potential challenges, and building strong, trusting relationships—ensuring that every patient's journey is as seamless and complication-free as possible.

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Each year, approximately 500,000 patients with end-stage kidney disease (ESKD) in the United States rely on chronic hemodialysis to manage their condition. A functional vascular access—whether an AVF, AVG, or tunneled dialysis catheter (TDC)—is critical for effective treatment. Malfunctioning access leads to treatment disruptions, hospitalizations, and increased mortality risk. The primary goal is to swiftly restore or maintain a functional access that supports the dialysis prescription while avoiding complications such as infection, hemorrhage, or steal syndrome and recognize when interventions are futile in unsalvageable cases. In 2025, three factors drive decision-making: timely access to care, patient-specific clinical needs aligned with a patient's life plan, and a commitment to cost-effectiveness.

1 Timely access to care.

Dialysis access interventions are critical for minimizing disruptions and preventing complications like thrombosis or infection. Evidence supports close monitoring in the dialysis unit, including regular assessment of access flow and physical examination, to detect early signs of dysfunction. When an intervention is warranted, the location of such care depends on local delivery systems, ideally with effective collaboration between outpatient vascular access centers and hospital-based facilities. Stable, lower-acuity patients can be managed in efficient outpatient settings, while complex patients are directed to hospitals. Public policy needs to be aligned with this clinical reality, with adequate support for the many outpatient vascular access centers around the country caring for the ESKD population that are adhering to evidence-based guidelines.

2 Patient-specific clinical needs.

Clinical decisions must align with the patient's overall health, life expectancy, and dialysis goals, as outlined in the 2019 KDOQI guidelines,[1] which emphasize an individualized life plan. For example, elderly patients or those with severe comorbidities may prefer a TDC over aggressive arteriovenous access salvage, accepting long-term infection risks to avoid short-term procedural risks. Tailoring treatment involves assessing vascular anatomy and procedural risk tolerance. Endovascular techniques, often less invasive than open surgery, reduce the need for anesthesia. This tailored approach aligns interventions with the patient's long-term well-being, avoiding unnecessary procedures that do not support their broader health objectives.

3 Commitment to cost-effectiveness.

The economic impact of access maintenance is significant, as interventions and hospitalizations drive health care costs. When used in carefully selected patients, advanced devices such as DCBs or stent grafts can reduce repeat interventions and associated hospitalizations. Outpatient settings can avoid anesthesia costs. Rapid referral for procedures that restore durable access and avoid complications will further minimize expenditures. Clinical efficacy and economic efficiency can both be achieved, ensuring prudent resource utilization that optimizes patient outcomes and system sustainability. ■

1. Lok CE, Huber TS, Lee T, et al; National Kidney Foundation. KDOQI Clinical practice guideline for vascular access: 2019 update. Am J Kidney Dis. 2020;75(4 suppl 2):S1-S164. Published correction appears in Am J Kidney Dis. 2021;77:551. doi: 10.1053/j.ajkd.2019.12.001