State of Dialysis Access and Current Challenges

Dr. Vandana Dua Niyyar discusses the current state of dialysis access and its challenges, essentials of a successful dialysis practice, device and therapy trends, the Transforming Dialysis Access Together initiative and its goals for education and training of fellows and dialysis access professionals, and ideals for the future of dialysis access.

How would you characterize the state of dialysis access in 2025?

There is a palpable excitement in the field of dialysis access right now—the growth in innovation is exponential, and we have seen more progress in the last 5 years than in the last 55 years since the first long-term dialysis accesses were created. Of course, inevitably, there have been some bumps along the road, but every challenge is an opportunity to learn, finesse, and redirect. The landscape in dialysis access is rapidly evolving and can be likened to a painting in progress; it poignantly reminds me of this quote from Vincent van Gogh: "As practice makes perfect, I cannot but make progress; each drawing one makes, each study one paints, is a step forward."

What are the commonalities among the challenges faced today in dialysis access, by individual physicians and by dialysis centers? And, how do you think institutional leadership and administration can best support their dialysis programs?

One of the key challenges in the care of dialysis patients has been fragmentation of care. For example, once the decision is made to initiate dialysis, it is the nephrologist who refers the patient for access creation, which is created by the proceduralist (surgeon, interventional nephrologist, or interventional radiologist). Then, access cannulation after maturity occurs in the dialysis unit by nurses and technicians, and proceduralists perform the necessary repeat procedures to maintain patency. Although the entire health care team is working toward a common goal, their roles are siloed, and each group works independently of each other, with little crosstalk between them.

Institutional leadership and administration can bring together these diverse groups and perspectives, facilitate a streamlined workflow with tangible and measurable outcomes, and align clinical and financial metrics in accordance with Centers for Medicare & Medicaid Services reimbursement targets and incentives. A win-win solution, and one that I am hoping to implement in our institution soon, is the creation of "dialysis access centers of excellence" where comprehensive multidisciplinary and interdisciplinary care would be provided to the patient as a one-stop shop, from preaccess creation counseling and modality education to timely creation and evaluation of dialysis access maturity and optimization of care processes for access maintenance.

What is common among the centers and individuals who are thriving amidst challenges? What are the essential elements of a successful dialysis practice in 2025?

The most successful dialysis practices have a team of passionate and enthusiastic leaders who blend clinical excellence with innovation and deliberately foster a multidisciplinary and interdisciplinary mission-driven approach that is centered around the patient perspective. As we navigate a rapidly changing landscape in 2025, a successful dialysis practice has the ability to adapt to these changes in real time. In this era of precision medicine and individualized, evidence-based care, essential elements of a thriving practice include an emphasis on home and personalized therapies; integration of digital infrastructure, including real-

time monitoring, telehealth, and artificial intelligence (AI)–driven predictive tools into decision-making; and data-driven quality improvements to adjust practice as needed.

What trends are you observing in support for device and therapy development?

There is a concerted effort within the dialysis industry to improve patient outcomes through technologic innovation and comprehensive education for both health care providers and patients. For example, KidneyX flagship initiatives (some of which I have had the privilege of reviewing and judging) include the Redesign Dialysis series, which has spurred advancements in wearable and implantable dialysis devices; the Artificial Kidney Prize, which aims to accelerate development of a bioartificial kidney from regenerative medicine, cellular and tissue engineering, and systems and synthetic biology communities; the Patient Innovator Challenge, in which people with kidney disease proposed experienced-based ideas for improving therapeutic options and quality of life; and more recently, the Sustainability Prize that focuses on innovations to reduce resources like water or power used during dialysis. By bringing together innovators, clinicians, patients, and policymakers, initiatives like these play a pivotal role in transforming kidney care.

Challenges in this space are not limited to financial constraints. There are also disparities in access to care, educational gaps, and technical challenges, to name a few, and the patient-centered Transforming Dialysis Access Together (TDAT) initiative is seeking to address some of these concerns. As Chair of TDAT, can you tell us about how this program came to be? What needs did you recognize that prompted the formation of the group, and what were the founding principles?

TDAT was born out of a collective recognition that our existing system for managing dialysis access was failing to meet the needs of the very people it was meant to serve—our patients. Recognizing that access challenges are compounded by multiple barriers throughout the processes of care, we aimed to leverage the expertise and passion of thought leaders in the field and address dialysis access dysfunction in a cross-cutting manner. What makes the TDAT initiative unique is the convening power and operational strengths of the American Society of Nephrology (ASN), which has been instrumental in bringing together these multiple diverse perspectives onto a common platform under the TDAT umbrella.[1]

TDAT's vision is to put the patient perspective front and center and champion a patient-centered multidisciplinary approach to improve dialysis access outcomes. Our mission is to (1) enhance quality of life for people with kidney failure; (2) engage kidney care team members, patients, and nephrologists as leaders in transformational change; and (3) improve practices, education, and policies around dialysis access.

I would like to emphasize that TDAT's accomplishments have built upon the foundation laid by so many before us and are a testament to their vision and dedication. Additionally, thanks to the unwavering support of ASN leadership and staff—especially Dr. Prabir Roy-Chaudhury, the current ASN President—and the enthusiastic and committed volunteers in each workgroup who have generously contributed their time, expertise, and service, we have made significant strides toward achieving our mission. TDAT has evolved from the fundamental work done by many passionate individuals in the field to an initiative that will (hopefully) change paradigms in dialysis access education and training and help optimize clinical care outcomes.

In 2023, the TDAT Steering Committee outlined three inaugural initiatives: comprehensive training for nephrology fellows, education for dialysis access professionals, and emphasis on quality. What steps have been taken toward these objectives in the years since?

Historically, nephrologists may have had limited troubleshooting expertise to address dialysis access issues because comprehensive education in this area has traditionally not been extensively incorporated into the training program curricula nor into continuing medical education opportunities in a systematic and patient-facing manner. TDAT workgroups have worked tirelessly to bridge this gap to ensure that every future graduating nephrology fellow has a fundamental knowledge of dialysis vascular access. The TDAT Medical Training workgroup initially evaluated current resources, as well as gaps and barriers in dialysis access education programs through feedback from nephrology training program directors and fellows-in-training via online surveys and roundtable discussions.[2] These findings were then used to develop a standardized, comprehensive, tiered dialysis access curriculum that will be made available to all training programs (manuscript in review). Furthermore, to help integrate dialysis access education into fellowship training, the curriculum will be supplemented by online educational modules created by the TDAT Education workgroup and regional in-person train-the-trainer sessions.

Provider education is at the cornerstone of TDAT. Can you tell us about some of the group's recent efforts in this area?

The TDAT Education workgroup is creating a comprehensive on-demand online education program targeting the various professionals involved in dialysis access care, including nephrologists, nurses, and dialysis technicians. The educational videos are available on the ASN website and supplement the tiered curriculum (essential, individualized, subspecialized) developed by the TDAT Medical Training workgroup. Initial content includes identifying the types of dialysis vascular accesses, conducting a detailed physical examination, and early recognition and management of complications (eg, infections, stenosis, ischemia, aneurysms), with subsequent modules focused on a case-based practical approach to troubleshooting dialysis access dysfunction in the dialysis unit.

How would you describe your vision for dialysis access care of the future?

Ideally, I would like to see the recent advancements in nephrology help us get to a world without kidney disease and without the need for dialysis. A few years ago, such a dream would have seemed audacious, but it is much more plausible now. However, until we get there, we need to continue to optimize dialysis access care and support innovations and advancements in technologies as well as processes of care.

The future of dialysis access care should be one where the right access, at the right time, for the right patient is not just an ideal but the standard. A utopian vision for dialysis access care would be one where arteriovenous fistulas and grafts are designed with bioengineered materials that resist infection, clotting, and failure, aided by smart sensors that continuously monitor flow, detect stenosis early, and guide timely intervention. Catheters will be rarely used, and when needed, they will be equipped with embedded antimicrobial and thrombolytic technologies to reduce their risks. Imaging, machine learning, and AI-assisted mapping will personalize access site selection based on patient anatomy, life expectancy, and lifestyle goals. Most importantly, the care model will shift to a team-based, patient-empowering approach—where surgeons, nephrologists, interventionalists, nurses, and patients collaborate on access planning, supported by value-based payment models that reward preservation of long-term function over short-term fixes so that we can make dialysis access our patients' *lifeline that lasts for a lifetime* instead of being their Achilles' heel. ■

1. Dua Niyyar V, Beathard GA, McLennan G, et al. Transforming Dialysis Access Together: a multidisciplinary, cross-cutting, patient-centered initiative. Clin J Am Soc Nephrol. 2024;19:1338-1340. doi: 10.2215/CJN.0000000000000569
2. Sparks MA, Burgner A, Baker A, et al. Current state and future direction of vascular access training in the United States. Clin J Am Soc Nephrol. 2025;20:539-546. doi: 10.2215/CJN.0000000646

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Scan to view the TDAT Vascular Access Education video series on the ASN website.