

Improving ESRD Patient Outcomes: Perspectives From Two Interventionalists

With Sanjay Misra, MD, FSIR, FAHA, and Monnie Wasse, MD, MPH, FASN, FASDIN

In this article, Drs. Misra and Wasse discuss their current approach to improving outcomes for end-stage renal disease (ESRD) patients despite the many challenges and touchpoints these individuals have with the medical system (Figure 1).

The delivery of health care in ESRD patients is driven by so many factors. Based on your geography and care setting, what does the general flow of patients look like in your system prior to access creation and through access maintenance?

Dr. Misra: Mayo Clinic is a hospital in an interesting location: Midwest, but near a large metropolitan area, and covering urban to suburban to rural populations. We used to be a closed system and only treated patients that received dialysis at Mayo itself, but that's shifted in recent years. Now, 10% to 20% of our maintenance procedures are from other facilities. Currently, we have dialysis patients receiving their hemodialysis sessions at 10 to 12 centers within a 2-hour radius.

When patients arrive with advanced kidney disease, they are seen in the chronic kidney disease (CKD) clinic for evaluation. In this clinic, etiologies for kidney failure (eg, renal artery stenosis) are ruled out, and patients needing dialysis vascular access are referred for vessel mapping and evaluation in the vascular access clinic (Figure 2). Patients are evaluated by either vascular or transplant surgeons for potential surgical creation of an arteriovenous fistula (AVF) or arteriovenous graft. Routine follow-up ultrasound is performed after access creation to assess for function and maturation prior to being sent to a dialysis unit.

Dr. Wasse: I'm also at a hospital in the Midwest in Chicago, but it's a much larger urban location that has scores of different insurance providers, resulting in barriers for patients when it comes to in-network insurance coverage. In addition, we have a fragmented referral pattern, so the route to getting an arteriovenous (AV) access varies. If a patient needs access creation (Figure 3A), they may first be referred by a nephrologist to a surgeon, or sometimes directly to me, an interventional nephrologist, for evaluation and preoperative mapping. When the surgeon is able to see them, there is often a discussion with the broader interventionalist team about the vessel mapping results, patient demographics, and other details that affect creation options. On the other hand, if a patient needs vascular access maintenance (Figure 3B), referrals can originate from the surgeons, community dialysis units, or the nephrologist. They can go to me as an interventional nephrologist or to my colleagues in interventional radiology (IR).

Importantly, the nephrologists lead the development of an access life plan, which is carried out by many different physicians and groups, largely based on how their individual practitioner at the time refers them for care. As a nephrologist, I see patients throughout the spectrum of their care, from CKD to transplant. In contrast to my surgical or IR colleagues, I round weekly at dialysis units and interact with the dialysis center personnel regularly, and this familiarity and ability to "speak their language" as a nephrologist is certainly very beneficial in planning and delivering access care.

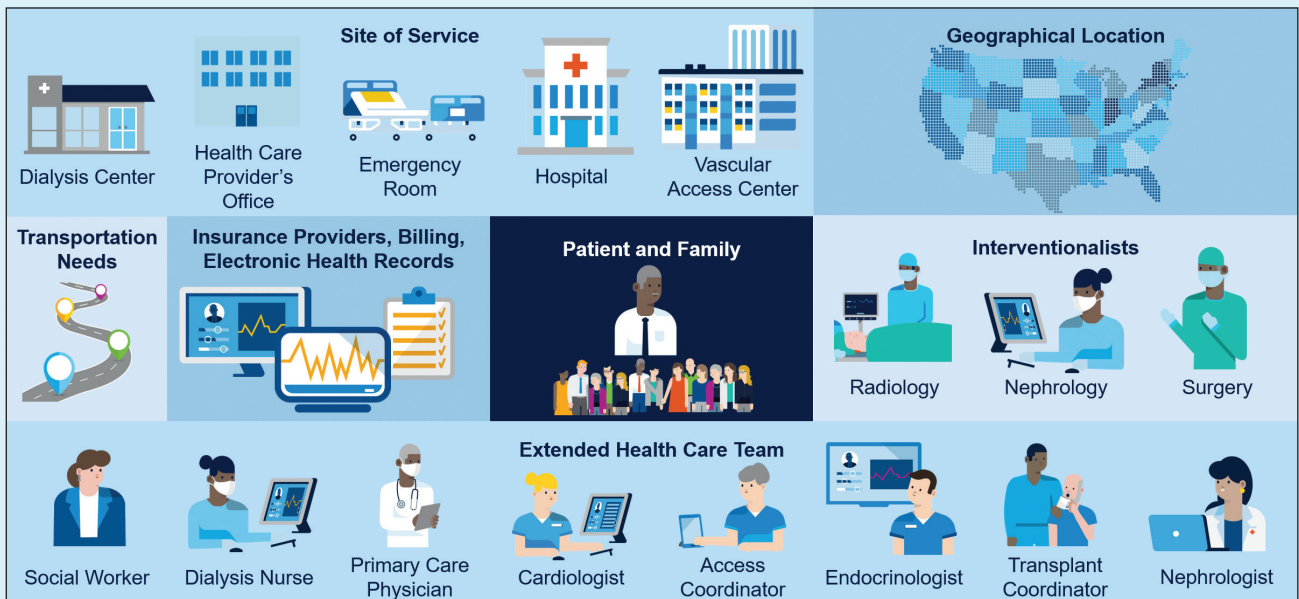


Figure 1. The complexities of navigating care for the ESRD patient.

Patients on dialysis are complex and interact with so many different health care providers. Based on your experiences, do you have recommendations on how to promote interdisciplinary relationships?

Dr. Misra: Health care providers almost universally care deeply about the patients, and yet, getting the best outcome for those patients is an uphill battle. As touched on in Figure 1, there are many challenges, from reimbursement to adoption rates of new technologies to geography and care settings. On top of that, there are the individual physician training, experience, and harmonics on which individual physicians work. As an interventional radiologist, I have a very different skill set, training, and approach than a transplant surgeon, but they are just as important to a patient's care as I am. Finding the core points of overlap here is key, and ensuring that the patient pathway is clear is critical. The Mayo team knows who orders vein mapping, who reviews it, and, currently, who creates and maintains access. These are very clear swim lanes, and a multidisciplinary team ensures that the best care gets to patients and helps avoid the seemingly never-ending turf battles that can crop up between different

specialties. Don't get me wrong—we do sometimes disagree on next steps. But, it's done in a way that is centered around the patient rather than the interventionalist. As we consider incorporating percutaneous AVF (pAVF) creation into the Mayo Clinic's overall offerings for patients, one thing we're thinking about a lot is how to ensure appropriate use. Patients shouldn't just be mapped by interventional radiologists looking to see if they're candidates for pAVF. They should be fully mapped and checked for full upper-arm options. If they are candidates for a radiocephalic fistula, they should be sent along to surgery for that creation.

Dr. Wasse: Promoting interdisciplinary partnerships in this space can be complicated. At the very start, your bar is already almost impossibly high given how most hospital systems incentivize compensation for physicians based on productivity and procedural volume. The system doesn't necessarily encourage partnership, and you're left in a place where the route to improving patient care is paved with challenge after challenge. I've seen some very successful partnerships, but they do require buy-in from leadership, enough

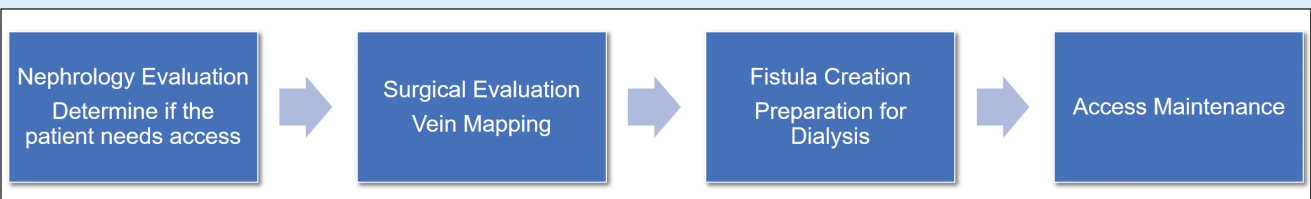
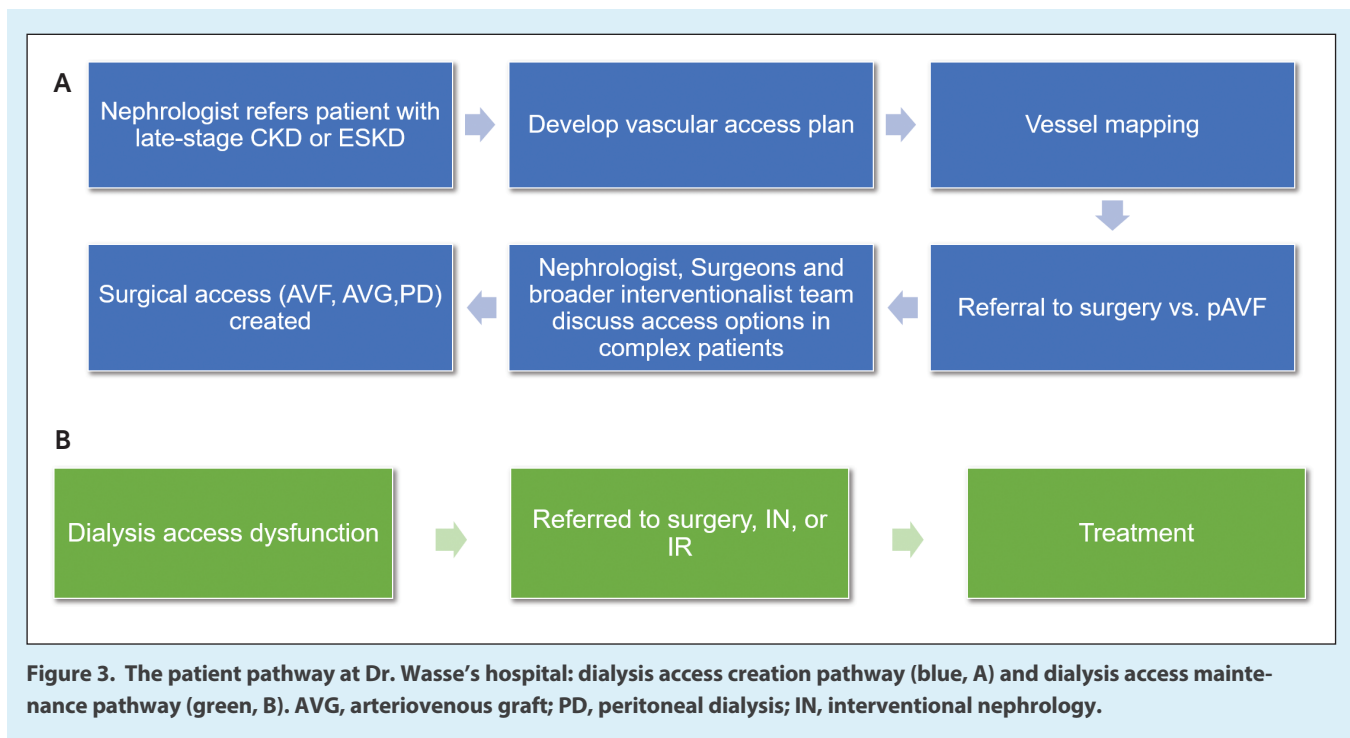


Figure 2. The patient pathway at Dr. Misra's hospital.



patients to satisfy individual caseloads, and the capability to do any needed dialysis creation and maintenance procedures. Ideally, interdisciplinary partnering is more than just a multi-disciplinary team meeting. If you can actually see and discuss individual patients together and respectfully discuss options, that's the way to go. Collaborative communication is vital.

Why is innovation in the ESRD space important?

Dr. Misra: Ultimately, a rising tide raises all boats. When larger companies make investments in technologies that disrupt the standard of care and improve patient outcomes, the gates are opened for smaller investments into the space: start-ups, grants to smaller labs, etc. can all flourish. Even if technology investments don't work out individually, an environment is created that, on the whole, benefits patients.

Dr. Wasse: Each decision leading up to or maintaining a vascular access has the potential to impact the patient long term, which is what many people lose sight of. There's a certain gravity to the creation and maintenance of access that is not always recognized. The mindset of "Well, if the first one doesn't work, we'll just do a second" can use up vascular territory and impact opportunities for a long-term, reliable vascular access. It's a loss for the patient (and frankly, for the payor).

Because ESRD patient anatomy is often disrupted from cardiac devices, peripherally inserted central catheter lines, frequent phlebotomy, or previous surgery, AV access creation and maintenance can be complex and warrants careful consideration and more creative solutions. It is wonderful to see more innovations in techniques and devices being used in this

space, and time will tell whether they can positively impact the outcomes and associated costs related to dialysis access in the United States.

If there was one thing you wish would happen to improve ESRD care, what would that be?

Dr. Misra: Taking care of ESRD patients with vascular access is a team sport. On the team are the patient, their health care providers (nephrologists, surgeons, interventional radiologists, advanced practice providers), and family members. Our goal is to make sure we have everyone on the team talking to each other so that we can provide the best care for the patient. Then, we must be sure to educate the patient about their care and the team approach we're taking and work with them to best meet the needs specified in their vascular access life plan.

Dr. Wasse: The development of quality metrics and an outcome-reporting requirement for vascular access procedures would go a long way toward raising the bar for vascular access care. First, many surgeons perform ≤ 14 AV access surgeries per year, which higher-volume surgeons argue isn't enough to hone or maintain skills.^{1,2} Second, as we start incorporating new technologies like pAVF, we need to know how these technologies perform in broader practice, beyond clinical trials.

Finally, and perhaps most importantly, physicians working in this space often have little to no feedback on their outcomes, and that gives them no opportunity to learn and improve. A surgeon can create an access, and then the patient

changes jobs and insurance; they have procedures done in other sites of service and come back months or years later with a stented or new access because care is so fragmented. Given the documented variability of surgical outcomes and number of access surgeries performed during training,^{1,3} the data suggest that a proportion of access outcomes can be attributed to surgical practice patterns. Thus, outcome reporting could be very useful in allowing patients to have the greatest opportunity for a successful access. ■

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