To receive lifesaving RRT, a patient must have some type of treatment access. Patients call this their “lifeline.” For peritoneal dialysis, this is a catheter surgically placed in the abdomen. With hemodialysis, it’s either an arteriovenous fistula (AVF) or graft (AVG) in the arm, or a tunneled catheter (CVC), usually in the upper chest.

The AVF is often considered the “gold standard” for hemodialysis access because it demonstrates the best overall performance, is associated with fewer infections and thus fewer hospitalizations, and tends to last longer than other access types. AVFs can, however, cause steal syndrome and draw needed blood supply from other areas of the body, affecting heart function. AVFs may also require ongoing maintenance, such as fistulograms and angioplasty. The biggest disadvantage of an AVF or AVG is that each requires the use of two very large needles. Overcoming a fear of needles and learning to self-cannulate is one of the hardest things that dialyzers face. In reality, all patients, not just solo dialyzers, should be taught to self-cannulate for many reasons:

- Only you can feel exactly where your fistula is and find the right places to stick;
- It hurts less if you stick yourself;
- You help preserve your fistula;
- Your risk of getting an infection is lower;
- Self-cannulation can increase your confidence; and
- Self-cannulation allows for a greater sense of control.

There are steps you can take to reduce fears and learn to self-cannulate. These include:

- Establishing control: Control can take three forms: mental, physical, and lifestyle. Mental control involves not allowing fear to grow in your mind. “When a needle goes in, it’s not the needle you’re scared of, it’s the thought of the needle going in. It’s your mind playing tricks on you,” said one patient.

- Building confidence: Members of your care team can help you build confidence. You can also gain confidence from expanding your own knowledge.

- Making it normal: Success in self-cannulating comes after accepting that it is part of daily living.

All means of dialysis access have pros and cons, as illustrated in Table 1.

Centers for Medicaid and Medicare Services (CMS) and CDC (Center for Disease Control) have mounted a Fistula First campaign (1), the name given to the National Vascular Access Improvement Initiative. This quality improvement project is being conducted by all 18 ESRD Networks to promote the use of AVFs in all suitable dialysis patients. As one physician stated, “Some people want to use the catheter. Some have no other choice. Some are fed up with intervention and don’t have the mental energy to proceed at the given time. The reason doesn’t really matter as long as the patient is informed and comfortable. Business metrics aside, it’s really not my job to force people into doing anything they don’t want to do.”

Unfortunately, business metrics are an important consideration for vascular access recommendations. At present, the CMS-mandated QIP rewards centers with high AVF prevalence and penalizes centers with high CVC prevalence. The current model does not take into consideration case-based adjustments for patients with greater comorbidities and clinical risk factors, essentially emphasizing a philosophy of “one-size-fits-all” for vascular access. Despite concerted efforts, there are still long delays in achieving a usable permanent access, attributable to delays in both surgical access placement and access maturation. In the interim, the CVC population is at risk for high rates of catheter-related bacteremia.

Moving toward a more patient-centered approach will require a greater focus on the subset of patients who will likely not realize the benefits of AVF placement, including elderly ESKD patients, patients with significant calcification or small arteries and veins, patients with slowly progressive CKD who are more likely to die than to progress to ESKD, and patients with poor overall health and prognosis and limited life expectancy. Furthermore, a greater emphasis should be placed on patient quality of life, comfort, and satisfaction versus solely on AVF targets and clinical outcomes (2).

Another clinician commented that “our long-term ‘home is best’ approach, home with a catheter is infinitely better and safer than is facility dialysis with a catheter. In some, where fistula access is difficult and a catheter becomes the access of need … careful self-care of a catheter at home beats a catheter in a center, any day!”
An incident patient who expects to receive a living donor transplant within a year or two might opt for peritoneal dialysis to preserve kidney function until the transplant can take place. Another patient who has just rejected his second or third transplant and who has no renal function would ideally have an AVF in place, or need to create one, to receive hemodialysis treatments. And a long-term dialyzer who has had several fistulas that ceased functioning may be out of "real estate" for another AVF. This dialyzer may have no alternative but to have a CVC placed for long-term use.

As one patient stated: "I've been using a catheter for 4.5 years and I do home hemo. I'm on my second fistula attempt and honestly, I'm starting to think I'll just stick with a catheter. Fight for what you believe is best for you. We have to advocate for ourselves all the time."

As one clinician stated, "I have plenty of home hemodialysis patients who have catheters. I have plenty who have decided to not seek out an AVF/AVG. Patients are aware of the risks and the benefits. It's the patient's choice. It's their body, their disease, their treatment. Like I say to my patients, no one is more dedicated to preventing infection than the patients themselves."

It is not about which access is better. All means of vascular access are lifelines to lifesaving RRT. The one thing all patients come to know, and dread, is the life-threatening, sucker-punched feeling they get when their access stops working. It is impossible for someone not on dialysis to understand the sense of panic that overwhelms the patient when their lifeline ceases to function. At most, it is frightening; at the very least, it is another daunting obstacle to overcome in a long list of dialysis-related treatment complications that dialyzers endure. In many cases, the only solution is to be admitted to the hospital, have a temporary catheter placed, and receive hospital dialysis until the fistula can be repaired or another AVF or AVG surgically created. The quality of surgical training in vascular access procedures is also critical for vascular access placement and successful development. Unfortunately, far too many procedures, especially emergency ones, may be performed by surgeons who lack experience with vascular access for dialysis. With the new techniques and innovation available for vascular access, we should not be seeing patients with their arms cut open from shoulder to elbow, or large scars with multiple staples.

In conclusion, even before deciding on an access for dialysis, a patient should be counseled in the types of RRT available to them, and which one would be most appropriate at any given point in time. From the patient perspective, there is no right or wrong method of access. It is about the right access, in the right patient, at the right time, for the right reasons.

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Author Contributions
N. Gedney wrote the original draft of the manuscript.

References

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Table 1. Comparison of types of access

<table>
<thead>
<tr>
<th>Access Type</th>
<th>Arteriovenous Fistula</th>
<th>Arteriovenous Graft</th>
<th>Central Venous Catheter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pros</td>
<td>Lasts longer</td>
<td>Excellent blood flow</td>
<td>Immediate use</td>
</tr>
<tr>
<td></td>
<td>Not prone to infection</td>
<td>Ability to shower</td>
<td>No needles</td>
</tr>
<tr>
<td></td>
<td>Excellent blood flow</td>
<td>Normal daily use of arm</td>
<td>Needs 2 weeks to mature</td>
</tr>
<tr>
<td></td>
<td>Less likely to clot</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ability to shower</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal daily use of arm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prone to stenosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cons</td>
<td>Needs 1–4 months to mature</td>
<td>Does not last as long as AVF</td>
<td>Usually temporary</td>
</tr>
<tr>
<td></td>
<td>Needs needles to connect</td>
<td>Prone to infection</td>
<td>Prone to infection</td>
</tr>
</tbody>
</table>

AVF, arteriovenous fistula.