

How Do You Utilize Your Network Partners Cohesively to Successfully Create an EndoAVF Program?

Experience-based insights of initiation and adoption of endoAVF creation using the WAVELINQ™ EndoAVF System.

WITH ALEJANDRO ALVAREZ, MD; AURANG Z. KHAWAJA, MD; AND GEORGE L. MUELLER, MD



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We run an outpatient vascular access center under the umbrella of ambulatory services of our hospital. We provide customized care to each patient. This allows the entire team to provide an experience for the patient that feels as though the process is an extension of the referring physician's practice. We keep the referring physician updated regarding the treatment and plan for his/her patient; every study—from screening, creation, and follow-up to cannulation—is made available. This allows us to set up expectations for both the patient and the referring nephrologist to maximize success.

With this kind of open communication, we are able to work as a team when the arteriovenous fistula (AVF) is ready for cannulation. We perform follow-up blood flow volume studies using ultrasound to confirm that the AVF has met blood flow volume and anatomic criteria for cannulation, per our facility's protocol ($Q_b > 500$ mL/min and a venous outflow diameter of > 5 mm). The AVF is mapped on the surface of the skin prior to first cannulation, and a representative from our center (typically our nurse practitioner) and a clinical specialist from BD are usually present at first cannulation. At this time, the process comes full circle.

The onus of this communication primarily falls on the physicians. As leaders of this multidisciplinary team, we make sure that expectations at each step of the process are clear for everyone (physicians, nurses, technicians, and most importantly, the patient), and we make ourselves available as a resource to maximize success—ultimately, cannulation and delivery of hemodialysis through a working fistula. To achieve this goal, we work closely with vascular surgeons who provide the necessary support to ensure success. This includes all of the surgical interventions when necessary, from transposition of deep fistulas to surgical revision of AV anastomosis when patients cannot be treated endovascularly.

When a patient is referred for endovascular AVF (endoAVF) evaluation, we screen the patient to determine if they are a candidate for the AVF procedure, and if candidacy is determined, they are usually scheduled for creation within a week. This decreases the time from first visit to creation, which should translate into faster cannulation of the fistula and decrease the risk of starting dialysis with a tunneled catheter.

In a situation where a patient is not a candidate for endoAVF, we proceed with full vascular mapping and the patient leaves the center with alternative options for vascular access creation. We then set up an appointment for the patient with a vascular surgeon, and all of the screening studies are communicated to the referring physician and the AV access surgeon. The idea is to make the process easy for the patient, the vascular surgeon, and the referring nephrologist.

Ultimately, this program should provide a quicker turnaround time for creating a successful AV access, whether it is an endoAVF or a surgical AVF.



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Planning, initiating, and establishing an endoAVF program requires a collaborative multidisciplinary approach between clinical and nonclinical stakeholders, and at our tertiary referral center, this has followed a long, cultivated, and deeply embedded culture of cross-specialty collaborative working. The first step is an up-to-date, in-depth knowledge and analysis of the local dialysis landscape, including operational characteristics and potential effects that an endoAVF program may have.¹ This allows development of a robust business case outlining potential collaborative benefits. Introducing a program can be approached in a three-step process²:

1. Feasibility analysis of current collaborative infrastructure and developing a strategic framework with appropriate knowledge acquisition, exchange, and expansion
2. Preparation of a formal proposal based on the aforementioned structure
3. Execution of the proposal, implementation of the program, and continued development and expansion under standards of care across all stakeholder domains

From our center's experience, adoption of a patient-centered approach that considers the benefits versus risks for all stakeholders can aid in developing a suitable, sizable, and sustainable program. Evidence reported in the literature has highlighted clinical efficacy and safety of an endoAVF program across various geographic populations, and the clinical efficacy and safety has been reproduced between study sites.³⁻⁹ The higher costs of the endoAVF device as compared with a surgical AVF may be justified by the potential for reduced risk of maturation failure, reduced number of interventions for maintenance in the first year after creation, and potential for dialysis catheter avoidance.^{4,10-13}

Deriving from our experience and based on existing literature, a framework may be proposed for initiation and development of a collaborative endoAVF program:

- **Recruitment.** What is the target renal patient population and what are the conceptualized benefits? How will patients be approached?

- Predialysis and on dialysis
- In center versus home versus satellite unit dialysis
- Certain or targeted centers to build up experience
- Failing transplant patients and peritoneal dialysis converters
- **Training the trainers.** Is there good stakeholder support and multidisciplinary collaboration to build on existing knowledge and promote knowledge exchange?
 - Dialysis nursing staff and technicians
 - Surgeon with an interest in dialysis access
 - Interventional radiologist with an interest in dialysis access or interventional nephrologist
 - Nephrologist with an interest in dialysis access or access outcomes
 - Management and/or administrative staff heavily invested in the targeted population
 - Local, regional, or national authorities' support for cultivating culture of native dialysis access
- **Infrastructure sustainability.** What is the capacity of the facility's dialysis program and ability to accommodate an endoAVF program?
 - Is access creation capacity being/been reviewed, whether it is a surgical, radiologic, or interventional nephrology lead, including educational needs?
 - Is access maintenance capacity being/been reviewed?
 - Has sufficient capacity in the targeted recruitment patient population and suitable educational potential for sustainability been determined? Positive patient feedback may drive demand and has been a trend observed in our experience after initiation of endoAVF creations.
 - Will the targeted population have access to respite/fallback care (eg, tunneled dialysis catheter care, alternative or other potential access, in-center support)?
 - What are the targeted costs compared with long-term cost savings related to admissions, interventions, and medications (ie, expect initial costs to be disproportionate with subsequent balance achieved as the program expands)?

Stakeholder involvement is critical, as is patient voice.¹⁴⁻¹⁶ Performing structured or semistructured interviews and dialysis unit educational seminars via a variety of media can simultaneously promote awareness and demand for the endoAVF program.^{17,18}

In conclusion, our experience based on the previously mentioned methodology has allowed for successful adoption of endoAVF creation. By following a collaborative framework, knowledge can continue to be disseminated across peers locoregionally and beyond to allow continued viability and sustainability.

Sponsored by BD

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Early on, my facility recognized that a team effort is required to ensure successful management of dialysis access and, specifically, the initiation of an endoAVF program.

Our outpatient department team has been specifically trained in the nuances of the dialysis access patient. We have a dedicated WAVELINQ™ EndoAVF System (BD) team, all of whom have been trained on the specifics of creating an endoAVF. The entire team contributes to the successes we have with our patients.

An important aspect of developing an endoAVF program is building relationships with the AV access community. Our core philosophy is that all who interface with the dialysis patient need to be informed and involved. To facilitate communication, we implemented a dedicated hotline that connects dialysis centers to an access coordinator (problem solver). That coordinator is armed with protocols and authority to manage acute crises as well as support an efficient workup of a candidate for the WAVELINQ™ EndoAVF System. The nurses and technicians at our dialysis centers are an essential part of the team, as they are the end users cannulating the WAVELINQ™

EndoAVF System creation. Another way we interface with the AV access community is through a program run by our midlevel providers called “Lunch and Bond,” which has allowed us to share information and educate others about the WAVELINQ™ EndoAVF System.

Both pre- and postoperative ultrasound protocols are essential to the success our team has achieved with the WAVELINQ™ EndoAVF System thus far. We have developed an A, B, and C grading system for the preoperative assessment of the potential WAVELINQ™ EndoAVF System candidate. An “A” patient has excellent arterial inflow, an ulnar vein in proximity to the ulnar artery, a generous perforator, and patent superficial outflow. The “C” patient is a “no-go,” and the “B” patient is a plus/minus. This grading system has kept us away from patients who should have an alternative form of dialysis access other than a WAVELINQ™ EndoAVF. Additionally, it has provided confidence during the procedure that patients who are candidates for endoAVF have a pathway to fistula creation. Postoperatively, the ultrasound team is oriented to diameter, depth, and flow at the proposed cannulation site. Their mission is early identification of patients with patent fistulas who need secondary procedures to achieve an optimal cannulation site, so that the nurses and technicians at the dialysis center can cannulate the WAVELINQ™ EndoAVF with confidence.

One of the most positive aspects of initiating the WAVELINQ™ EndoAVF System program for me personally has been watching the team come together with a common goal and observing each individual’s enthusiasm for serving the needs of this very important and oftentimes ill patient population. ■

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