Interventional nephrology is in the midst of an exponential growth phase, with data from the U.S. Renal Data System suggesting that at least 25 percent of total vascular access procedure costs are billed by nephrologists (1). Indeed, it is likely that the growth of interventional nephrology as a distinct discipline within nephrology has played an important role in the success of process-of-care initiatives, such as Fistula First, which has raised the arteriovenous fistula (AVF) prevalence rate from 34 percent in December 2003 at the start of this initiative to 59.5 percent as of August 2011 (2). Despite these positive indicators, however, dialysis vascular access remains a huge clinical problem. Specifically, almost 80 percent of incident hemodialysis patients start with a tunneled dialysis catheter (TDC) (3), only 40 percent of AVFs are suitable for hemodialysis between 4 and 5 months after surgery (4), and the 1-year primary patency for polytetrafluoroethylene (PTFE) dialysis access grafts is only 23 percent (5). Clearly, we need to do better! Although there are multiple biological and process-of-care reasons for these problems (6–10), we believe that an important underlying cause of these clinical problems is a relative lack of focused basic science, translational, clinical, and process-of-care (outcome) research in the field of dialysis vascular access. In addition, the induction of formal, high-quality research initiatives into interventional nephrology programs in particular could potentially transform the standing of this distinct discipline within nephrology both within nephrology and internal medicine. Thus, research programs in this area could go a long way toward enhancing the standing of interventional nephrology in the eyes of nephrology program and division directors, and they could constitute an important step toward making interventional nephrology a true distinct discipline within nephrology akin to transplantation nephrology. Such research programs could also help bring interventional nephrology into academic institutions. Is this absolutely necessary? It is likely that research in this area will only be successful if it has a solid base within academia. Furthermore, the ASN’s Interventional Nephrology Advisor Group of the American Society of Nephrology (INAG) in combination with the council of the American Society of Diagnostic and Interventional Nephrology recently submitted several applications for research investigation to the Kidney Research National Initiative through the National Institute of Diabetes, Digestive and Kidney Diseases. In addition to the areas described previously, improvement in long-term dialysis outcomes, optimization of endovascular and surgical complications.

More recently, a survey sent out to the membership of the American Society of Diagnostic and Interventional Nephrology identified (a) arteriovenous fistula maturation, (b) process-of-care guidelines for the creation and maintenance of dialysis vascular access, and (c) PTFE graft stenosis as the three most pressing areas for research into dialysis vascular access, in the order described.

In addition, the ASN’s Interventional Nephrology Advisor Group of the American Society of Nephrology (INAG) in combination with the council of the American Society of Diagnostic and Interventional Nephrology recently submitted several applications for research investigation to the Kidney Research National Initiative through the National Institute of Diabetes, Digestive and Kidney Diseases.

Research Opportunities in Interventional Nephrology

By Prabir Roy-Chaudhury

Interventional nephrology is in the midst of an exponential growth phase, with data from the U.S. Renal Data System suggesting that at least 25 percent of total vascular access procedure costs are billed by nephrologists. Indeed, it is likely that the growth of interventional nephrology as a distinct discipline within nephrology has played an important role in the success of process-of-care initiatives, such as Fistula First, which has raised the arteriovenous fistula (AVF) prevalence rate from 34 percent in December 2003 at the start of this initiative to 59.5 percent as of August 2011. Despite these positive indicators, however, dialysis vascular access remains a huge clinical problem. Specifically, almost 80 percent of incident hemodialysis patients start with a tunneled dialysis catheter (TDC) (3), only 40 percent of AVFs are suitable for hemodialysis between 4 and 5 months after surgery (4), and the 1-year primary patency for polytetrafluoroethylene (PTFE) dialysis access grafts is only 23 percent (5). Clearly, we need to do better! Although there are multiple biological and process-of-care reasons for these problems (6–10), we believe that an important underlying cause of these clinical problems is a relative lack of focused basic science, translational, clinical, and process-of-care (outcome) research in the field of dialysis vascular access. In addition, the induction of formal, high-quality research initiatives into interventional nephrology programs in particular could potentially transform the standing of this distinct discipline within nephrology both within nephrology and internal medicine. Thus, research programs in this area could go a long way toward enhancing the standing of interventional nephrology in the eyes of nephrology program and division directors, and they could constitute an important step toward making interventional nephrology a true distinct discipline within nephrology akin to transplantation nephrology. Such research programs could also help bring interventional nephrology into academic institutions. Is this absolutely necessary? It is likely that research in this area will only be successful if it has a solid base within academia. Furthermore, the ASN’s Interventional Nephrology Advisor Group of the American Society of Nephrology (INAG) in combination with the council of the American Society of Diagnostic and Interventional Nephrology recently submitted several applications for research investigation to the Kidney Research National Initiative through the National Institute of Diabetes, Digestive and Kidney Diseases.

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Another approach, which has been espoused by INAG as a way to lay a firm foundation for a long-term commitment to research activity in this field, is to support the establishment of several academic dialysis access centers (ADACs). These centers will (a) establish basic or translational research programs focused on dialysis vascular access, (b) develop clinical research programs (both investigator initiated and industry sponsored), and (c) establish dedicated (1-year) interventional nephrology training programs where nephrology fellows will be trained not just to do procedures but also to understand the biology, epidemiology, and process of care of dialysis vascular access.

We believe that the establishment of such ADACs will not only increase the opportunities for well-funded high-quality research in this area but also play a key role in allowing interventional nephrology to grow, by establishing a place for this distinct discipline within nephrology within divisional limits. Therefore, although these ADACs are likely to have a home within divisions of nephrology, it is critical that they retain a multidisciplinary nature, because dialysis vascular access dysfunction is by definition a multidisciplinary problem.

In summary, we believe that this is the time to aggressively develop a formal structure for focused research into dialysis vascular access. We know the problems, and we are asking the questions that need to be asked. In addition, we are lucky that the past decade has seen phenomenal advances in bioengineering, drug delivery, nanotechnology, and cellular therapies, all of which could have a positive impact on dialysis vascular access. We need to apply these biological and technological advances (combined with outcomes and process-of-care research) to the clinical problem of dialysis vascular access so that we can improve the care we provide our patients. The development of high-quality research programs focused on dialysis vascular access is essential for this to be achieved.

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References