Training Nephrology Fellows in Temporary Hemodialysis Catheters and Kidney Biopsies Is Not Needed and Should Not Be Required

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This opinion piece argues against the training of all nephrology fellows in the United States in our profession’s two major procedures: dialysis catheter insertion and percutaneous kidney biopsies. Many of us choose nephrology as a career because of a role model’s influence, the intriguing relationship of kidney physiology to health and disease, the kidney’s central role in the function of other organs and processes, the kidney’s involvement in systemic diseases and organ transplantation, and the care for critically ill patients, typically in intensive care units. The latter also affords the opportunity to be “hands on procedurally” by placing acute hemodialysis catheters, as does performing a kidney biopsy to inform our decision-making by utilizing pathology. However, I have come to believe that regardless of who is placing the line or performing the kidney biopsy, nephrologists are integral in the care team because of the kidney, dialysis, and transplant expertise that only we can provide. In my mind, these two nephrology procedures are therefore not an essential part of what it means to be a nephrologist in 2018.

I believe patient safety is at risk because we lack adequate and standardized procedural training, and standards for procedural competence post-training. Acute complications after temporary dialysis catheter insertions and kidney biopsies occur in 1%–5% and 15%–20% of cases, respectively (1). Of Canadian nephrology trainees, 33% were not adequately trained to insert a temporary catheter, 20% had not inserted a line in the preceding 6 months (2), and no trainees met a predetermined minimum passing score to competently insert temporary dialysis catheters (3). Of graduating nephrology fellows in the United States, 25% had not placed a line during training, 58%–68% placed fewer than ten temporary dialysis catheters, and barely half performed more than ten ultrasound-guided native (52%) and transplant (51%) kidney biopsies (4). One third of nephrologists do not feel competent to insert lines (5). Taken together, we must candidly ask if our profession can stand up in the court of public opinion and defend the training of nephrology procedures to ensure the safest, highest quality patient care.

Further informing my stance on limiting procedural training is that nephrologists are performing fewer procedures over time. Although accurate data in the United States is limited (6), 45% and 78% of registered nephrologists in Australia and New Zealand do not perform kidney biopsies or line insertions, respectively (7). I suggest that there is likely a similar decline in nephrologist-performed procedures in the United States. This reflects reduced needs and demand, and a changing culture, for the following reasons. First, in acutely ill patients requiring dialysis for more than a “few” days, there has been a major shift away from the use of temporary dialysis catheters (historically a nephrology’s domain) toward the placement of tunneled dialysis catheters (interventional radiology domain). Second, complex medical patients with hypotension, bleeding tendencies, obesity, and previous venous cannulation require expert skill to minimize procedural complications. Third, very high clinical volumes, time-consuming factors beyond the procedure itself (patient consent, optimizing blood product timing, controlling BP), and the heavy burden of documentation stretch nephrology fellows very thin, adding to trainee stress, and compounding existing generational life–work balance expectations. Fourth, the unspoken truth is that clinical care preferences are influenced by measuring physician productivity in the United States by work relative value units (wRVU). For example, initial complex inpatient and outpatient consultations are 3.86 and 3.17 wRVUs, respectively, and one monthly outpatient dialysis visit is 3.15 wRVUs. These are significantly higher (and quicker to undertake) than the 1.75 and 2.38 wRVUs for nontunneled central venous catheter and kidney biopsy, respectively. These wRVUs reflect January 2018 data (www.cms.gov/apps/physician-fee-schedule).

I am not opposed to procedures performed by highly trained, skilled, and experienced nephrologists, who do so regularly and frequently. Indeed, that would be my preference! So why might I suggest we no longer mandate procedural training for all nephrology trainees? The answer simply lies in patient safety and the quality of care delivered. After training by experts, procedural skills of any type require ongoing and continual hands-on experience. For example, a single-center study showed that clinician experience, defined as >50 central venous catheter insertions, resulted in significantly fewer complications compared with
inexperienced operators when ultrasound was not used (8). Currently the nephrology profession has no such criteria during and after training, nor is there a standard for “training the trainers” responsible for supervising trainee procedures. Moreover, supervising a trainee’s procedure is simply not sufficient to maintain one’s own procedural competence, as attendings were no better than their trainees at inserting lines, creating a “blind leading the blind” analogy (9). The notion that having performed a procedure in the past is sufficient to maintain competence down the road despite minimal ongoing clinical practice is nothing short of hubris. At a minimum, nephrologists should maintain procedural skills using simulation-based mastery learning. Lessons from surgeons and interventional radiologists show that expertise requires a minimum procedural volume for initial learning, and a minimum volume is also critical to maintain ongoing competence (10). Concerning is that 41% of United States nephrology training programs had no minimum requirement for catheter placement (11), despite the American Society of Diagnostic and Interventional Nephrology suggesting this need. Would one have a surgeon, radiologist, or nephrologist perform an invasive procedure on a patient or family member if they have not done so in a long while, only do so occasionally, only supervise trainees but do not do so themselves, and do not record their outcomes? I certainly would not.

This begs the question, for the sake of patient safety, is a revamped standardized nephrology procedural training requirement reasonably attainable for all fellowship programs, and is it worth the time and expense, and vigilant training oversight? Again, I say no. Nephrologists seem satisfied when fistulas, grafts, peritoneal dialysis catheters, renal artery angioplasty, tunneled dialysis catheters, and “high-risk” kidney biopsies requiring computed tomography guidance are performed by other disciplines. Does this mean we should categorically abandon nephrology procedural training? Not necessarily. I believe that rather than mandating procedural training for all trainees, we contextualize this to the trainee’s probable professional goals with a “personalized nephrology procedural training program.” For example, a physician-scientist trainee who, after 1 year of clinical training, will spend a minority of their time doing clinical work should not be required to train in procedures. The majority of urban private practices do not require nephrologists to perform procedures, or may necessitate specific techniques that require retraining because the practice environment is different from the training environment (e.g., requiring ultrasound assistance). In contrast, remote rural practices might require procedural skills. To increase and improve procedural training for the small subset of nephrology trainees who desire or will require these skills for future practice, we need to consider electives with a specialized interventional nephrology training program. Another approach would be to change the overall training and hiring culture by placing the burden for procedural training on the hiring practice if nephrologists are expected to perform procedures. Within academia, procedures should be restricted to a small nephrology team expert in procedures. Put a different way, in this era of sub-subspecialists and increasingly personalized medicine, a one-size-fits-all approach to training does not make sense.

Importantly, nephrology trainees and educators should not view my opposition to procedural training as an excuse to completely opt out of the tacit knowledge expected and required around procedures. Rather than obsessing with all nephrology trainees learning procedures, we should focus on training all future nephrologists (regardless of career choice), on the nephrologic expertise around procedures themselves. This includes the procedure’s indications and contraindications, the anatomy involved, the molecular underpinnings of complications, optimal patient preparation for the procedure, diagnose and treat complications, be familiar with any sedation medications used, interpret postprocedure measures, know how many biopsy needle passes can be performed safely on diseased kidneys, and which fixatives are a priority. Surely, to distinguish nephrologists from other subspecialties, the abovementioned clinical care skills are far more important than inserting a catheter or needle into a sick patient. The value-add of a nephrologist might be spending more time with the patient, developing a differential diagnosis, and diagnostic and therapeutic plans.

Finally, although others have eloquently written about the “crisis and identity” of nephrology as a profession, and the number of United States fellows that should be trained annually—concerns that I fully share—I am opposed to the notion that we need to maintain dialysis catheter placement and kidney biopsies for the sake of the survival of our subspecialty. I am also opposed to clinging to these two kidney-related procedures as a mechanism to attract trainees to the field. Rather, we need to be considering other ways to enhance the choice of our subspecialty as a career path for future trainees, which is beyond the scope of this opinion piece. Performing dialysis catheter placement and kidney biopsies should focus on patient safety first and foremost, which requires a group of very dedicated, qualified, and skilled operators who do this day-in and day-out, whether they are nephrologists or not. If a nephrologist fulfills these simple criteria, they should certainly participate in these two procedures. In my opinion, procedural skills are not required to proudly wear the badge of a nephrologist.

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References


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