Kidney360

Kidney Biopsy Should Remain a Required Procedure for Nephrology Training Programs: PRO

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KIDNEY360 3: 1664–1666, 2022. doi: https://doi.org/10.34067/KID.0007772021

Introduction

Kidney biopsy has become an integral part of diagnosing and treating kidney disease in the field of nephrology. In the 1990s, 91% of kidney biopsies were performed by nephrologists (1). However, there has been a decline in numbers of kidney biopsies performed by nephrologists over the past decade (2–4). Some of the implicated factors include logistics, time constraints, fellow and faculty comfort, litigation, ease of accessibility to radiologists, and concern for post-biopsy complications (4–6).

The Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Internal Medicine (ABIM) currently require performing kidney biopsy as a competency for graduation and initial board certification, respectively (7,8). This suggests programs need to continue to provide opportunities to train nephrology fellows in kidney biopsies and assess their training for competency. However, there are no defined competency-based criteria or minimum number of biopsies to define adequate training. A survey of program directors in 2017 noted that only 51% believed that kidney biopsy competency training should continue to be required during fellowship training (4). In 2018, a spirited debate ensued, with Berns discussing the pros and Shankland discussing the cons of continuing to require kidney biopsies for fellowship programs (5,9). Berns concluded, "In the absence of an overwhelming consensus to the contrary among the broad nephrology community, training nephrology fellows in these procedural skills should not be abandoned" (5). This brings up the question of whether this landscape is still relevant. Should our fellowship programs still require biopsies as part of training? Our argument is "yes."

Advantages to Kidney Biopsy

With uncertain requirement for competency and only a slight majority of program directors suggesting biopsies should be a continued competency, why should biopsies be a core part of fellowship? We see several advantages for this competency. Continuing with kidney biopsies would allow us to align with fellow interest, nurture patient-provider communication, improve diagnosis, and build the next generation of nephrologists.

From a nephrology fellow perspective, 58% enjoyed performing kidney biopsies and encouraged further training on the basis of a 2016–2017 survey study at Walter Reed that assessed kidney biopsy trends after graduation (4). The study also noted that 83% of fellows felt they were adequately trained to perform kidney biopsies during training. With good communication and clinical skills being paramount for the nephrology practitioner, having kidney biopsies be part of continued practice would ensure delivering patient-centered and quality care. Additionally, involving nephrologists in kidney biopsies would allow continuity of care and follow the natural progression of disease that would affect diagnosis and management.

Shanklan *et al.* argued that kidney biopsies should be performed by experienced radiologists to minimize patient complications such as bleeding risks (9). However, several studies noted no difference in complication risk when performed by fellows under supervision versus radiologists (2,6,10,11). Nephrologists have also been shown to have a better glomerular yield than radiologists in several studies (2,3). This could be attributed to better understanding of the anatomy and use of 14- or 16-gauge needles. Radiologists often use the 18-gauge needle, which has been shown to have a smaller glomerular yield with no change in rate of post-biopsy bleeding (12).

Another advantage nephrologists performing kidney biopsies is to increase interest in the field. One of the factors implicated in the decline in interest in the field of nephrology is the lack of procedural training when compared with other specialties (13). Integrating procedures such as kidney biopsy training can increase exposure to procedural training. For those programs that can accommodate this interest, individualizing a fellow's experience with even more procedural training may give a new avenue to increase recruitment. This recruitment may also lead to an increase in nephrology interventional practitioners, diversifying our nephrology workforce options even more. See Table 1 for advantages of kidney biopsy training and suggestions for implementation.

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Table 1. Advantages of kidney biopsy training and recommendations for implementation

Advantages	Implementation Recommendations (PROS)
Fellow factors	
Skillful kidney biopsy procedural training	Provide simulation-based training every 6 months as part of nephrology fellowship training requirements
Fellowship factors	
Re-engage nephrology fellowship educators	Redefine evidence-based competency recommendations by involving stakeholders and disseminate to all fellowships
Specialty factors	
Interest and diversification of the nephrology workforce	Organize individualized procedural training for interested fellows and expose medical students and residents to this possibility
Patient factors	
Patient-centered care	Support communication between fellows and patients in biopsy care

Future Directions

We propose increasing initiatives for simulation-based training to increase faculty and fellows' confidence in performing kidney biopsies. The ACGME includes simulation training as part of one of the assessment tools to ensure competency in procedural training. Dawoud *et al*. developed a turkey breast/pork kidney phantom-based simulation training of real-time ultrasound-guided renal biopsy (14). The curriculum improved fellows' confidence by an average of 46.9 points on a 100-point scale. More importantly, it resulted in improvement in retrieval of kidney biopsy tissue by 94% compared with 73% in fellows who did not participate in the training. Finally, the rate of hematocrit drop was also significantly lower post training (1.18 versus 2.68; $P=0.05$). Sharma *et al*. developed an educational workshop targeting nephrology fellows that utilized a mannequin and cadaveric-based simulation layout to increase confidence, interest, and knowledge when performing kidney biopsies. The study found an increase in the level of procedural confidence from 14% to 41% after the workshop. Sixty-seven percent of participants also noted they would be "extremely likely" to recommend the workshop (3). Finally, providing intermittent training and/or workshops every 6 months has been shown to restore confidence and knowledge in procedural-based training (15).

We also note that our governing body's guidance on procedural requirements may need adjustment. The current nephrology ACGME guidance on procedural training is imprecise and may explain the decline in kidney biopsy training during fellowship training. There needs to be a priority to develop an evidence-based competency assessment tool to define procedural excellence at the end of training. A committee of different stakeholders, including the ACGME, ABIM, program directors, fellows, and nephrology educators skilled in kidney biopsy, and other procedural training is likely needed to develop a consensus to define competency-based training metrics that can be incorporated into the ACGME milestones and disseminated to all nephrology fellowships in the United States.

With increasing case complexities, we also should embrace collaborative care of our patients with other specialties. The use of ultrasound has allowed this with our radiology colleagues; let us continue to build the relationships with rheumatologists, cardiologists, pulmonologists, and other providers who may benefit from the information gleaned from a kidney biopsy. Continuing our central role in kidney biopsy performance would avoid fragmentation of care and allow us to be at the forefront of our patients' decision making.

Conclusion

With procedural training during fellowship, we should consider the advantages of kidney biopsies moving forward. Performance of kidney biopsies is a skill that needs to be nurtured during fellowship training to prepare future nephrologists on managing complex patients and delivering individualized care. Procedural training has been shown to be safe and effective with a higher glomerular yield when performed by nephrology fellows. Some strategies to improve the current decline in procedural training would include integration of simulation-based training, redefining competency-based assessment, and providing structured, collaborative procedural rotations with protected time to increase confidence and interest in performing kidney biopsies. The question then becomes not whether we should continue kidney biopsies during fellowship but insteadhow we should advocate for this as a priority.

Disclosures

All authors have nothing to disclose.

Funding

None.

Acknowledgments

The content of this article reflects the personal experience and views of the authors and should not be considered medical advice or recommendation. The content does not reflect the views or opinions of the American Society of Nephrology (ASN) or *Kidney360*. Responsibility for the information and views expressed herein lies entirely with the authors.

Author Contributions

Z. Obaidi and S.M. Sozio wrote the original draft and reviewed and edited the manuscript. S.M. Sozio was responsible for supervision.

References

1. Tape TG, Wigton RS, Blank LL, Nicolas JA: Procedural skills of practicing nephrologists. A national survey of 700 members of the American College of Physicians. *Ann Intern Med* 113: 392–397, 1990 https://doi.org/10.7326/0003-4819-113-5-392
2. Chung S, Koh ES, Kim SJ, Yoon HE, Park CW, Chang YS, Shin SJ: Safety and tissue yield for percutaneous native kidney biopsy according to practitioner and ultrasound technique. *BMC Nephrol* 15: 96, 2014 https://doi.org/10.1186/1471-2369-15-96
3. Sharma SG, Arthur JM, Bonsib SM, Phelan KD, Singh M, Karakala N, Bulloch KW, Niyyar VD, Velez JCQ: An integrated pathology and ultrasonography-based simulation for training in performing kidney biopsy. *Clin Nephrol* 89: 214–221, 2018 https://doi.org/10.5414/CN109267
4. Yuan CM, Nee R, Little DJ, Narayan R, Childs JM, Prince LK, Raghavan R, Oliver JD 3rd; Nephrology Education Research and Development Consortium (NERDC): Survey of kidney biopsy clinical practice and training in the United States. *Clin J Am Soc Nephrol* 13: 718–725, 2018 https://doi.org/10.2215/CJN.13471217
5. Berns JS: Training nephrology fellows in temporary hemodialysis catheter placement and kidney biopsies is needed and should be required. *Clin J Am Soc Nephrol* 13: 1099–1101, 2018 https://doi.org/10.2215/CJN.00040118
6. Korbet SM, Whittier WL, Rodby RA: Changing trends in the performance of percutaneous renal biopsy from nephrologist to interventional radiologist: A single-center experience. *Am J Nephrol* 48: 326–329, 2018 https://doi.org/10.1159/000493925
7. Accreditation Council for Graduate Medical Education: Common Program Requirements. ACGME Program Requirements for Graduate Medical Education in Nephrology, 2020. Available at: https://www.acgme.org/globalassets/PFAssets/ProgramRequirements/148_Nephrology_2020.pdf?ver=2020-06-29-162357-583&ver=2020-06-29-162357-583. Accessed November 24, 2021
8. American Board of Internal Medicine: Internal Medicine Subspecialty Policies; Nephrology Policies, 2021. Available at: https://www.abim.org/certification/policies/internal-medicine-subspecialty-policies/nephrology/. Accessed November 24, 2021
9. Shankland SJ: Training nephrology fellows in temporary hemodialysis catheters and kidney biopsies is not needed and should not be required. *Clin J Am Soc Nephrol* 13: 1102–1104, 2018 https://doi.org/10.2215/CJN.01260118
10. Esposito V, Mazzon G, Baiardi P, Torreggiani M, Semeraro L, Catucci D, Colucci M, Mariotto A, Grosjean F, Bovio G, Esposito C: Safety and adequacy of percutaneous kidney biopsy performed by nephrology trainees. *BMC Nephrol* 19: 14, 2018 https://doi.org/10.1186/s12882-017-0796-y
11. Gupta RK, Balogun RA: Native renal biopsies: Complications and glomerular yield between radiologists and nephrologists. *J Nephrol* 18: 553–558, 2005
12. Sousanieh G, Whittier WL, Rodby RA, Peev V, Korbet SM: Percutaneous renal biopsy using an 18-gauge automated needle is not optimal. *Am J Nephrol* 51: 982–987, 2020 https://doi.org/10.1159/000512902
13. Jhaveri KD, Sparks MA, Shah HH, Khan S, Chawla A, Desai T, Iglesia E, Ferris M, Parker MG, Kohan DE: Why not nephrology? A survey of US internal medicine subspecialty fellows. *Am J Kidney Dis* 61: 540–546, 2013 https://doi.org/10.1053/j.ajkd.2012.10.025
14. Dawoud D, Lyndon W, Mrug S, Bissler JJ, Mrug M: Impact of ultrasound-guided kidney biopsy simulation on trainee confidence and biopsy outcomes. *Am J Nephrol* 36: 570–574, 2012 https://doi.org/10.1159/000345305
15. Ahya SN, Barsuk JH, Cohen ER, Tuazon J, McGaghie WC, Wayne DB: Clinical performance and skill retention after simulation-based education for nephrology fellows. *Semin Dial* 25: 470–473, 2012 https://doi.org/10.1111/j.1525-139X.2011.01018.x

Received: December 2, 2021 **Accepted:** December 13, 2021

See related debate "Kidney Biopsy Should Remain a Required Procedure for Nephrology Training Programs: CON," and commentary, "Kidney Biopsy Should Remain a Required Procedure for Nephrology Training Programs: COMMENTARY," on pages 1667–1669 and 1670–1671, respectively.