

1 **Supplemental Content**

2 Appendix A: Educational Needs Assessment Survey

3 Appendix B: Complete Methods and Recruitment Strategy

4

5

## **Appendix A: Educational Needs Assessment Survey**

### **1) Which of the following are used in your fellowship curriculum?**

*Select all that apply*

- ☐ Curriculum Lectures—led by fellows
- ☐ Curriculum Lectures—led by attendings
- ☐ Journal Clubs—led by fellows
- ☐ Journal Clubs—led by attendings
- ☐ Fellow-led case reports ("morning report style")
- ☐ Grand Rounds—presented by fellows (formal presentation on a case/topic)
- ☐ Grand Rounds—presented by attendings (formal presentation on a case/topic)
- ☐ Key articles or reading lists/collections
- ☐ Online audio/video recordings of presentations (e.g., Grand Rounds, Lectures)
- ☐ Online collaborative learning forum where fellows can post questions, cases, resources, and presentations
- ☐ Uninterrupted protected time for renal physiology, pathophysiology, and/or clinical nephrology review (separate from core-curriculum lectures)
- ☐ Renal Pathology Conferences
- ☐ Morbidity and Mortality Conferences
- ☐ Kidney biopsy simulation training
- ☐ Temporary dialysis catheter simulation training
- ☐ Formal ultrasound training
- ☐ Interventional Nephrology Training
- ☐ Communications training for end-of-life care and dialysis decision-making

### **2) Which topics would you most like to receive additional instruction in during fellowship?**

- ☐ Hemodialysis
- ☐ Peritoneal Dialysis
- ☐ Home Hemodialysis
- ☐ Temporary Dialysis Catheter Placement
- ☐ Kidney Biopsy
- ☐ Inpatient General AKI Diagnosis/Management
- ☐ Acute GN Diagnosis/Management
- ☐ Nephrotic Syndrome
- ☐ Diabetic Nephropathy
- ☐ Outpatient CKD Diagnosis/Management
- ☐ Secondary Hypertension Diagnosis/Management
- ☐ Electrolyte Disorders/Acid-Base Disorders
- ☐ Anemia of Renal Disease Management
- ☐ Mineral and Bone-Disease Management
- ☐ Nephrolithiasis

- 47 ☐ Urinalysis
- 48 ☐ Kidney US Interpretation
- 49 ☐ Renal Pathology Interpretation
- 50 ☐ Post-transplant Acute Inpatient Management
- 51 ☐ Post-transplant Outpatient Management
- 52 ☐ Care of Adults w/Pediatric Renal Disease
- 53 ☐ Genetic Renal Diseases
- 54 ☐ Obstetric Nephrology
- 55 ☐ Toxicology
- 56 ☐ Nutrition
- 57 ☐ Renal Pharmacology
- 58 ☐ Geriatric Nephrology
- 59 ☐ Conservative/Palliative Management of ESRD
- 60 ☐ Other \_\_\_\_\_

61

62 **3) How would you rate the overall quality of teaching in your fellowship?**

- 63 ☐ Poor
- 64 ☐ Fair
- 65 ☐ Good
- 66 ☐ Excellent

67

68 **4) Which of the following educational tools have you used in the last 3 months?**

69 *Select all that apply*

- 70 ☐ UpToDate
- 71 ☐ ASN NephSAP
- 72 ☐ ASN KSAP
- 73 ☐ JASN articles
- 74 ☐ CJASN articles
- 75 ☐ AJKD articles
- 76 ☐ Journal articles in general
- 77 ☐ AJKD Kidney Core Curriculum
- 78 ☐ Textbooks
- 79 ☐ ASN Online Geriatrics Curriculum
- 80 ☐ ASN Online Dialysis Curriculum
- 81 ☐ KDIGO/KDOQI Clinical Practice Guidelines
- 82 ☐ Renal Fellow Network Blog
- 83 ☐ AJKD Blog
- 84 ☐ NephJC (Twitter-based journal club)
- 85 ☐ Other \_\_\_\_\_

86

87 **5) How likely are you to participate in the following educational strategies as a fellow?**

	Very Unlikely	Unlikely	Neither Likely Nor Unlikely	Likely	Very Likely
Watching online recordings of Lectures, Grand Rounds, or Journal Clubs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Renal Pathology Conferences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Key article reading list with fellow-authored article summaries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problem sets ("homework") on various topics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer simulation exercises of HD/PD cases where you can alter prescriptions and follow results	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dedicated time for renal physiology, pathophysiology, and/or clinical nephrology review	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fellow-led in-person case-based pathophysiology/management discussions ("morning report style")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fellow-led online case-based pathophysiology/management discussions where fellows share and contribute to cases on a regular basis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conferences between local fellowships (ex. in New England) targeted at fellows	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Case-based debates between specialties (e.g., rheumatology and nephrology fellows)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communications training for end-of-life care and dialysis decision-making	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interventional Nephrology Training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Simulated catheter placement training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Simulated renal biopsy training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training in performing ultrasound	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Formalized "pre-tending" as a fellow (acting as an attending during consultation rotations with minimized formal attending supervision)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Formal education in "How to teach"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Formal teaching opportunities (e.g., medical school, IM residency lectures)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

89    **6) Describe two changes that could improve your fellowship's educational environment.**

90

91    **7) Rate your current level of preparedness for entering independent general nephrology**  
92    **practice.**

93    ☐ Not prepared

94    ☐ Minimally prepared

95    ☐ Moderately prepared

96    ☐ Fully prepared

97

## **Appendix B: Complete Methods and Recruitment Strategy**

The educational needs assessment survey was created by the lead author (RR) with guidance from an educational researcher (SBM) and followed an iterative review process with the American Society of Nephrology (ASN) Workforce Committee members, including the other co-authors. The final survey consisted of seven questions on the following topics: the overall quality of teaching in fellowship; educational modalities used in fellowship; educational topics requiring additional emphasis; and likelihood to participate in novel educational interventions. The content assessed generally aligned with those from the 2010 survey by Berns, as well as the Accreditation Council for Graduate Medical Education (ACGME) nephrology program guidelines and ACGME/American Board of Internal Medicine Milestones project.<sup>1-3</sup> To allow respondents to suggest additional changes needed in their programs, one qualitative question asked respondents to “Describe two changes that could improve [their] fellowship’s educational environment.” The survey was piloted with nephrology faculty within the lead author’s institution and cognitive interviews were performed with medical students to evaluate the clarity of the survey. This survey development process generated confidence in the content validity of the survey.<sup>4</sup>

We distributed the survey by email in conjunction with the ASN Nephrology Fellows Survey at the end of the academic year (May and June 2016) via the secure REDCap survey platform. Multiple approaches to improve participation were implemented. These included incentives (complimentary ASN memberships or Board Review Course Update registration), extending the participation deadline twice, outreach to training program directors through email and verbal contact, as well as reminders to respondents distributed through multiple media channels including social media, direct outreach to fellows through the ASN website, and eight email reminders to recipients. These methods align ASN survey practices with those of other large

medical organizations such as the American Association of Medical Colleges (personal communication, co-author KAP).

Contingency table (Chi-square) testing was used to evaluate differences in demographic characteristics between respondents, recipients, and fellows nationally as well as for differences in perceived preparedness for independent practice between respondents of different years. Responses for “not prepared” and “minimally prepared” were combined given reduced numbers. We analyzed the quantitative data using descriptive statistics for central tendency (mean and standard deviation), overall counts and percentages, and frequency distributions. Analyses were conducted using GraphPad Prism software. Qualitative data was analyzed via an inductive, thematic approach. The ASN Nephrology Fellows Survey was reviewed and exempted by George Washington University's Institutional Review Board (IRB). The educational needs assessment survey questions were also exempted from review by Stanford University's IRB.

## References

1. Berns JS: A Survey-Based Evaluation of Self-Perceived Competency after Nephrology Fellowship Training. *Clin J Am Soc Nephrol* 5: 490–496, 2010
2. Accreditation Council for Graduate Medical Education: ACGME Program Requirements for Graduate Medical Education in Nephrology (Internal Medicine). [http://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/148\\_nephrology\\_int\\_med\\_2016.pdf](http://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/148_nephrology_int_med_2016.pdf). Last accessed 10/04/2016.
3. Accreditation Council for Graduate Medical Education and American Board of Internal Medicine: The Internal Medicine Subspecialty Milestones Project [Internet]. 2016 Available from: <http://www.acgme.org/Portals/0/PDFs/Milestones/InternalMedicineSubspecialtyMilestones.pdf> [cited 2016 Apr 10]
4. Beckman TJ, Cook DA, Mandrekar JN: What is the validity evidence for assessments of clinical teaching? *J Gen Intern Med* 20: 1159–64, 2005