

# Fellowship Education: What to Watch (and from Where)

By Matthew A. Sparks

2020 was a challenging year in nephrology education. In-person annual meetings shifted virtual, and many of us learned firsthand the concept of “Zoom fatigue,” as our institutional meetings and conferences moved virtually. The National Institutes of Health (NIH) made a big announcement that will likely have a long-lasting impact on research training. Home dialysis education was front and center. How will the nephrology education landscape continue to evolve in 2021?

## Virtual conferences are here to stay

There is no denying that virtual education is here to stay. Coronavirus infectious disease 2019 (COVID-19) resulted in an almost complete shift to the use of virtual platforms to host local, national, and international conferences (1). The nephrology community worked hard to adapt, with major conferences, like ASN Kidney Week and the National Kidney Foundation (NKF) Spring Clinical Meeting, among others, moving virtual.

Fellows, who were looking forward to a break in a new city from busy clinical work, in-person education, and networking, were instead faced with several days of screen time. How would they be able to network effectively? This was especially concerning given that fellows are just getting started in nephrology and have more limited collaborator, mentor, and sponsor networks than more established nephrologists. The nephrology conference landscape for fellows was impressive leading up to 2020 and COVID-19 with offerings for private practice (National Business Leadership University), education (KIDNEYcon), home modalities (Home Dialysis University), critical care (CRRT Academy), and cardio-nephrology (Cardio Renal Connections), among many others. Many of these conferences provided funding for travel and lodging to trainees. Thankfully, most of these important educational offerings are trying to make the most of video-conferencing platforms as well.

The online nephrology space has one of the most well-developed communities in medicine, with educational programming in a variety of modalities from websites to Twitter,

to podcasts, to videos (2). In addition, year-long programs for trainees include the Nephrology Social Media Collective (NSMC) Internship, the *American Journal of Kidney Diseases (AJKD)* Editorial Internship, the newly established Glom-Con Virtual Glomerular Disease Fellowship, and NephSIM Nephrons mentoring program. We will be watching to see how the nephrology community continues to adapt in the virtual space during 2021. Even if in-person meetings return in 2021 and beyond, it is becoming clear that at least some virtual component is here to stay.

## Changes in NIH’s National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) T32 Program

NIH’s National Research Service Award (NRSA) T32 Program has been a mainstay of funding for fellowship programs to secure protected academic time for fellows interested in pursuing careers as physician scientists (3). In spring 2020, the NIDDK’s Division of Kidney, Urologic, & Hematologic Diseases (KUH) announced an unexpected and sudden end to the T32 program. The KUH T32 programs will now be replaced by an Institutional Network Award for Research Training (U2C/TL1) mechanism. This announcement has led to considerable concerns from the nephrology research community. So how is the U2C/TL1 mechanism different? Following are some of the differences:

- An emphasis on fostering a community of trainees
- One application that supports at least five trainees across kidney, urology, and hematology research areas
- Encouragement for multiple institutions within the same metropolitan area to submit a single, joint application

American Society of Nephrology (ASN) Senior Policy Specialist Ryan Murray reviewed this change in *Kidney News Online* (July 2020), due to concern about how the change will affect funding for nephrology fellows (4). Some concerns noted are the diminished number of overall awards available, the even smaller proportion of training slots that go to nephrology fellows, and the potential to favor larger institutions. Time will tell how this policy change will impact the overall number and long-term success of our trainees wishing to pursue research careers in nephrology.

## More emphasis on home dialysis modalities in fellowship

Under the Advancing American Kidney Health (AAKH) Initiative (5), use of home dialysis modalities by patients with kidney failure is expected to increase. Will nephrologists be able to care for this growing population of patients?

A survey of US nephrology fellows in 2017 showed that almost one-half of all respondents indicated they had little or no training in peritoneal dialysis or home hemodialysis (6).

It is incumbent upon our fellowship programs to ensure that fellows are adequately prepared. A recent survey of 76 US nephrology fellows who attended Home Dialysis University courses in 2019 showed that a majority were moderately confident in administering peritoneal dialysis, but most had low confidence in home dialysis (7). These findings underscore the importance of including more training in home dialysis modalities in fellowship programs. Educational curricula should include both didactic sessions and a focus on longitudinal care of patients using these modalities during the two-year Accreditation Council for Graduate Medical Education (ACGME) fellowship. Additionally, select fellows can enroll in an additional year of training. ■

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## References

1. Hilburg R, et al. Medical education during the COVID-19 pandemic: Learning from a distance. *Adv Chronic Kidney Dis* 2020. doi: 10.1053/j.ackd.2020.05.017
2. Dave NN, et al. An introduction and guide to becoming a social media savvy nephrologist. *Nephrol Dial Transplant* 2020; gfaa067. <https://doi.org/10.1093/ndt/gfaa067>
3. Rangarajan S, Agarwal A. Current state and future of research in nephrology. *Adv Chronic Kidney Dis* 2020; 27:305–311.e1. doi: 10.1053/j.ackd.2020.05.008
4. Murray R. Against ASN recommendation, NIDDK suspends KUH participation in parent T32 program and announces new institutional training program. *Kidney News Online* July 9, 2020. <https://www.kidneynews.org/policy-advocacy/leading-edge/against-asn-recommendation-niddk-suspends-kuh-participation-in-parent-t32-program-and-announces-new>. Accessed November 27, 2020.
5. US Department of Health and Human Services. Advancing American Kidney Health 2019. <https://aspe.hhs.gov/system/files/pdf/262046/AdvancingAmericanKidneyHealth.pdf>. Accessed November 27, 2020.
6. Rope RW, et al. Education in nephrology fellowship: A survey-based needs assessment. *J Am Soc Nephrol* 2017; 28:1983–1990. doi: 10.1681/ASN.2016101061
7. Gupta N, et al. Perceptions of home dialysis training and experience among US nephrology fellows [published online ahead of print November 16, 2020]. *Am J Kidney Dis* doi: 10.1053/j.ajkd.2020.09.014; [https://www.ajkd.org/article/S0272-6386\(20\)31091-X/fulltext](https://www.ajkd.org/article/S0272-6386(20)31091-X/fulltext)

# Acquiring Novel Agents for Kidney Disease in India: A Pipe Dream or Science Fiction?

By Mayuri Trivedi

Recently, the world of nephrology rejoiced at another “positive” trial in nephrology: Dapagliflozin in Patients with Chronic Kidney Disease (DAPA-CKD) (1). But in India and other nations in the South Asian subcontinent we also are deeply concerned by the fact that the sodium glucose cotransporter-2 inhibitors (SGLT2i) are scarcely available and, when they are, place a huge financial burden on our patients who manage to procure them. Dapagliflozin costs the US dollar equivalent of \$0.89 for a 10-mg tablet in India (compared

to one 75-mg tablet of aspirin [ASA] at \$0.038 and one 10-mg tablet of atorvastatin 10 mg at \$0.12), and the costs of drugs are not covered by the insurance companies.

On second thought, at least this drug is available, albeit not as freely as we would want. An expanding list of drugs seems to have lost “novel” status in the Western world, but physicians in the South Asian subcontinent have not had the pleasure of experiencing the magic of these drugs in their patients. Many might not be aware that drugs such as patiomer and sodium zirconium cyclosilicate, which were

approved for use in the United States in 2015 and 2018, respectively, remain unavailable in India. Eculizumab, an anti-C5 monoclonal antibody, which was approved in 2007 by the US Food and Drug Administration as a game changer in patients with atypical hemolytic uremic syndrome (2), is still available only through a restricted access program in India as a research molecule. The BENEFIT trial clearly showed better patient and graft survival after kidney transplantation, with higher rates of estimated GFR for belatacept in a 7-year follow-up study published in 2016 (3). Although centers in

India were part of this multicenter trial, this drug remains unavailable in India as of today.

The lists of medications that promise to mitigate some of the kidney maladies continue to remain a clinician's dream in India despite comparable rates of kidney disease burden globally. This glaring disparity in the distribution of resources, including the newer drugs in the nephrologist's tool kit, seems to significantly contribute to the abysmal outcomes for kidney diseases in India and other nations in the South Asian subcontinent. The delivery of healthcare in India, including kidney disease healthcare, rests on the shoulders of an overburdened public sector infrastructure and a large, yet expensive, private sector. More often than not, patients end up paying for the drugs and for disposables personally, inasmuch as insurance schemes and government health policies are restricted in their outreach and their benefits. Integral to providing holistic kidney disease care is ensuring the availability of all recent and novel drugs that are proving to reduce morbidity and mortality in our patients. Perhaps nephrologists in the Western world can help change this situation. Table 1 lists potential ideas on how this can be achieved.

Until we overcome this deep abyss in the South Asian subcontinent, we will continue to regard these novel kid-

ney drugs as part of science fiction. Many of us identify well with this quote by the American author Ray Bradbury: "I have never listened to anyone who criticized my taste in space travel, sideshows, or gorillas. When this occurs, I pack up my dinosaurs and leave the room." ■

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#### References

1. Heerspink HJL, et al. DAPA-CKD Trial Committees and Investigators. Dapagliflozin in patients with chronic kidney disease. *N Engl J Med* 2020; 383:1436–1446. doi: 10.1056/NEJMoa2024816
2. Legendre CM, et al. Terminal complement inhibitor eculizumab in atypical hemolytic-uremic syndrome. *N Engl J Med* 2013; 368:2169–2181. doi: 10.1056/NEJMoa1208981
3. Vincenti F, et al. Belatacept and long-term outcomes in kidney transplantation. *N Engl J Med* 2016; 374:333–343. doi: 10.1056/NEJMoa1506027. Erratum in: *N Engl J Med* 2016; 374:698.

**Table 1. Possible solutions for easing the procurement of novel nephrology drugs in South Asia**

1. Development of generic brands of novel drugs produced locally in each country
2. Innovative insurance schemes targeted at specific diseases that collect regular small amounts per person per month to provide the required high-budget drugs
3. Government-aided schemes for specific drugs
4. Dedicated nongovernmental organizations or groups that may help in crowd-funding for specific drugs
5. Rational, transparent, and protocol-based process of approval of newer drugs in India that is patient-centric and without bureaucratic hurdles
6. Group efforts by relevant nephrology societies with adequate representation to urge government bodies to hasten procurement and availability of life-saving drugs

## Pediatric Nephrology Developments Anticipated for 2021

By Ray Bignall II

Children are our future, and the year ahead in pediatric nephrology holds tremendous promise to advance healthcare for children with kidney diseases. The pediatric nephrology community has been hard at work championing the innovations and advocating for the change necessary to make a brighter future a reality for children with kidney diseases, their families, and those who care for them. With so many exciting advances across the spectrum of pediatric kidney care, here are a few of the areas to follow closely in 2021.

### Neonatal nephrology—the nascent field is now full term

There is growing appreciation for the role of prenatal and neonatal kidney health in nephron endowment at birth and long-term risks for chronic kidney disease (CKD). Despite the technical limitations that make studying the mechanisms of neonatal kidney pathophysiology so challenging, advances continue, particularly in the area of neonatal acute kidney injury (AKI) (1).

Recent research has resulted in a better understanding of the prevalence of neonatal AKI, and strategies for AKI mitigation and nephrotoxicity reduction are emerging (2, 3). Now with the help of the Neonatal Kidney Collaborative, a coalition of neonatologists, nephrologists, and scientists dedicated to improving kidney outcomes in neonates, pediatric kidney professionals around the world are connecting and sharing best practices (4). Several children's hospitals [including Riley Children's in Indiana, Nationwide Children's in Ohio, and Medical University of South Carolina (MUSC) Shawn Jenkins Children's in South Carolina] have launched jointly run clinical services with both nephrology and neonatology. These partnerships serve to streamline referrals, facilitate the identification of neonatal kidney disease, and improve outcomes. The field of neonatal nephrology will continue to mature in the year to come.

### Kidney support therapies—little machines that pack a big punch

The adage "children are not little adults" is as old as the field of pediatrics itself. Yet, when it comes to the use of kidney

support therapies, children have been treated as little adults. The year 2020 saw the introduction of the first pediatric-specific kidney support device ever approved by the US Food and Drug Administration (FDA) for use in children under 10 kg: the Cardio-Renal Pediatric Dialysis Emergency Machine (CARPEDIEM) (5). Along with the Newcastle Infant Dialysis and Ultrafiltration System (NIDUS) (6) and the adaptation of ultrafiltration-specific devices for modified kidney replacement therapy (7), the emergence of pediatric-specific, miniaturized devices, which feature lower blood flows and circuit volumes, is something to watch this year.

### Coronavirus infectious disease 2019 (COVID-19), kids, and kidneys—are we sure the kids are alright (8)?

Mercifully, children have been spared much of the morbidity and mortality associated with severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection. In summer 2020, early data suggested that the incidence of COVID-19 was no different for children with kidney disease on systemic immunosuppression (e.g., those with kidney transplants, glomerulonephritis) than children not on immunosuppression (9). However, data from late 2020 demonstrated an AKI prevalence of 44% in children critically ill with COVID-19, which mirrors the prevalence among critically ill adults (10) and is higher than that of critically ill children without SARS-CoV-2 (11). As the course of the pandemic changes and novel coronavirus vaccines become widely available, pediatric nephrologists will be watching closely for clues as to the long-term impact on our patients. ■

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#### References

1. Harer MW, et al. Preterm birth and neonatal acute kidney injury: Implications on adolescent and adult outcomes. *J Perinatol* 2020; 40:1286–1295. doi: 10.1038/

- s41372-020-0656-7
2. Stoops C, et al. Baby NINJA (Nephrotoxic Injury Negated by Just-in-Time Action): Reduction of nephrotoxic medication-associated acute kidney injury in the Neonatal Intensive Care Unit. *J Pediatr* 2019; 215:223–228.e6. doi: 10.1016/j.jpeds.2019.08.046
3. Askenazi DJ. AWAKEN-ing a new frontier in neonatal nephrology. *Front Pediatr* 2020; 8:21. doi: 10.3389/fped.2020.00021
4. Selewski DT, et al. Neonatal acute kidney injury. *Pediatrics* 2015; 136:e463–e473. doi: 10.1542/peds.2014-3819
5. Vidal E, et al. Continuous veno-venous hemodialysis using the Cardio-Renal Pediatric Dialysis Emergency Machine™: First clinical experiences. *Blood Purif* 2019; 47:149–155. doi: 10.1159/000494437
6. Coulthard MG, et al. Haemodialysing babies weighing <8 kg with the Newcastle Infant Dialysis and Ultrafiltration System (NIDUS): Comparison with peritoneal and conventional haemodialysis. *Pediatr Nephrol* 2014; 29:1873–1881. doi: 10.1007/s00467-014-2923-3
7. Menon S, et al. Kidney support in children using an ultrafiltration device: A multicenter, retrospective study. *Clin J Am Soc Nephrol* 2019; 14:1432–1440. doi: 10.2215/CJN.03240319
8. Townshend P. "The Kids Are Alright" in *My Generation* (Brunswick Records, UK), 1965.
9. Marlais M, et al. The severity of COVID-19 in children on immunosuppressive medication. *Lancet Child Adolesc Health* 2020; 4:e17–e18. doi: 10.1016/S2352-4642(20)30145-0.
10. Bjornstad EC, et al. Preliminary assessment of acute kidney injury in critically ill children associated with SARS-CoV-2 infection: A multicenter cross-sectional analysis [published online ahead of print November 12, 2020]. *Clin J Am Soc Nephrol* doi: 10.2215/CJN.11470720; <https://cjasn.asnjournals.org/content/early/2020/11/11/CJN.11470720>
11. Kaddourah A, et al. Epidemiology of acute kidney injury in critically ill children and young adults. *N Engl J Med* 2017; 376:11–20. doi: 10.1056/NEJMoa1611391