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Practices Face Triple Whammy of Inflation, Payment Cuts, and Staff Shortages

By Melanie Padgett Powers

At the small nephrology practice, The Kidney Experts, PLLC, in West Tennessee, expenses for every type of service increased in 2022: the copier service contract, the cleaning crew, the shredder service, and more.

"It's all of the things that are necessary to be kosher as a practice and do everything correctly.… Every single one of these fixed costs [has] increased over the past year," said nephrologist Shree Mulay, MD. He and his wife, Anna Lee-Mulay, MD, also a nephrologist, own The Kidney Experts. The practice has four clinic locations and 20 dialysis units and employs five nurse practitioners and 12 support staff.

At the same time, a reduction in dialysis patients takes away that known monthly income, Shree Mulay said. "We've been very successful in reducing our new start rates and keeping patients off of dialysis, which is where you get a fixed revenue on a monthly basis. We see a decrease in cash flow because we're doing the right thing."

Physician practices that survived the height of the COVID-19 pandemic are now facing multiple business challenges, including ongoing inflation, Medicare cuts, and the "great resignation" that has made it difficult to find, hire, and retain quality staff. For the past 2 years, inflation has affected all aspects of American life—including the costs to run a nephrology practice. After a peak increase of 9.1% in June 2022, inflation started to cool in the United States by the end of last year, but goods and services are still expensive. Inflation remained at 7.1% in November 2022 from the previous November, and analysts do not expect it to fall to 2%–3% anytime soon. In addition, physicians will see a 2% Medicare cut this year, reduced from an initial 4.5% cut when Congress passed the omnibus legislation last December. Physicians could face another 3.5% cut in 2024. However, the American Medical Association points out that, when adjusted for inflation, Medicare physician payments actually dropped by 22% from 2001 to 2021.

Congress also postponed for 2 years cuts from the federal Pay-As-You-Go (PAYGO) Budget Rule, which was created in 1990 to reduce the federal deficit. PAYGO encourages Congress to offset costs from legislation that would increase

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Fellowship First, Residency Next: The Untold Story of Exceptionally Qualified Candidates in Nephrology

By Sujith Kumar Palleti

The decline in interest in nephrology fellowships is well documented (1). However, what is more striking is the decline in interest in nephrology among international medical graduates (IMGs) (2, 3). In the United States, IMGs are defined as graduates from a medical school located outside of the United States and Canada. In 2019, 65% of US nephrology fellows were IMGs, a high number compared with other specialties, such as cardiology (37%), hematology oncology (35%), and gastroenterology (31%) (4). Although the number of IMGs who pursue nephrology fellowship is high, the absolute number of IMGs in nephrology fellowships has substantially declined by almost 50% from 2009 to 2019 at the same time as fellowship positions became unfilled in nephrology (Figure 1, see jump page).

Common reasons for the declining interest include the challenging patient population (6), perceived difficulty of the subject, declining competitive compensation rate, and lack of work-life balance (7). However, the recent decline in nephrology interest among IMGs, who may share some of the same reasons as US graduates, needs to be further studied.

It is now obvious in the nephrology community that

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foreign-trained physicians, who are joining as exceptionally qualified candidates, as defined by the Accreditation Council for Graduate Medical Education (ACGME), after completing their home-country residency and credential verification, are a growing group and form an incredible pool to support our nephrology community (8). Thus, obtaining exact data on the numbers and outcomes of IMG physicians who helped to fill nephrology fellowship positions that would otherwise go unoccupied is an unmet need. According to the annual ASN Nephrology Fellow Survey data from 2019 to 2022, the percentage of IMGs who entered fellowship training without prior US internal medical training has increased from 1.5% to 7% (Figure 2). However, the survey respondents only included a fraction of the total nephrology fellows in training (~20%).

Who is an exceptionally qualified candidate?

As defined by the ACGME (10), an exceptionally qualified applicant is someone who has 1) completed a non-ACGME-accredited residency program in the core specialty and 2) demonstrated clinical excellence, in comparison with peers, throughout their training. Additional evidence of exceptional qualifications, which are required, may include one of the following: 1) participation in additional clinical or research training in the specialty or subspecialty; 2) demonstration of scholarship in the specialty; 3) demonstration of leadership abilities during or after training; or 4) completion of an ACGME-International (ACGME-I)-accredited residency program. ACGME-I accreditation demonstrates that graduate medical educational programs outside of the United States meet established requirements for institutional, foundational, and advanced specialty education (11).

What happens to these exceptionally qualified physicians?

Fellowship training is usually the last phase of training for most physicians, and they start practicing right away. But for many of these exceptional pathway candidates, it is only the beginning of the hard and long road ahead. They cannot become eligible to sit for the American Board of Internal Medicine (ABIM) Nephrology subspecialty examination after completion of fellowship, according to ABIM guidelines, which require first passing the Internal Medicine ABIM examination. Eligibility to sit for the Internal Medicine ABIM examination requires completion of an internal medicine residency in the United States or Canada accredited by the ACGME, the Royal College of Physicians and Surgeons of Canada, or the Collège des médecins du Québec. Additionally, the candidates are unable to obtain a permanent license in 26 out of the 50 states in the United States, according to the data compiled by the Federation of State Medical Boards (12). These 26 states require completion of 3 years of training. (Some states require this to be in an ACGME-accredited training program.) Thus, most candidates need to undergo an additional 3 years of US residency in internal medicine after a fellowship to fulfill various requirements to practice in the United States.

A hypothetical case of an IMG

Dr. X is an IMG who completed medical school in Country XYZ and studied hard to join an internal medicine residency in Country XYZ. However, she always dreamed of working in the United States as a physician and thus completed all the required United States Medical Licensing Examination program exams to apply for an ACGME-accredited nephrology fellowship in the United States as an exceptionally qualified IMG. She came to the United States with hopes of getting an unrestricted license after 2 years of nephrology training and working as a nephrologist in the United States, as the demand for physicians is huge and felt everywhere. As she navigated her fellowship training as a busy nephrology fellow, she realized that her options were far more difficult and uncertain than she had anticipated.

Many states do not allow her to obtain a permanent or unrestricted license because as mentioned above, they require 3 years of training in 26 of the 50 states (some requiring ACGME accreditation for all 3 years) or completion of a US internal medicine residency. Unfortunately, nephrology fellowships are accredited by the ACGME for 2 years, not 3 years; thus, she will not meet this requirement. She was also told by many that the ideal situation is to re-do internal medicine residency in the United States, but obtaining residency has gotten tougher year by year for IMGs.

Although doing a fellowship in the United States is one of the most challenging phases of a physician's career, having limited options and the potential of having to leave the United States permanently can take their toll on anyone. Under current circumstances, fellowship training in the United States without Nephrology ABIM certification does not carry much value, which means a waste of time and effort. The situation is not ideal for the health care community either, as there is a growing need for physicians, which makes it a lose–lose situation.

Difficulties in obtaining a job for exceptional pathway candidates

Limited J-1 waiver positions are available. The specialty of Nephrology has always relied on IMGs in fellowship training and beyond. Many of these IMG fellows train on the J-1 exchange physician visa sponsored by the Education Commission for Foreign Medical Graduates (ECFMG). Any J-1 exchange physician sponsored by the ECFMG is subject to a 2-year home-country physical presence requirement (13) before applying for jobs in the United States. To waive this requirement, the physician needs to work in underserved areas for 3 years. Although many doctors are willing to work in those areas, the waiver slots are limited to 30 per state under the Conrad 30 Waiver Program (14), which can be extremely competitive. Historically, when waiver slots become available in September or October, many states get filled immediately (15). For example, in Texas, the waiver program opens and closes on the same day on September 1st every year, as all of the slots are filled within a few minutes of opening (16). States such as Illinois, New York, Florida, and California receive a higher number of applications than the available waiver slots, and slots are exhausted in the first few weeks (17, 18).

A permanent license to practice is limited. The inability to obtain permanent or unrestricted licensure in many states is a huge drawback because of the state licensure requirements in 26 states, previously discussed. Of the remaining 24 states, although getting a waiver spot is a difficult task in many of them, as mentioned above, other states have very few programs that can offer faculty positions for nephrology-trained fellows. There is an inability to join private solo or group practices due to the difficulty in obtaining hospital privileges or an inability to become a dialysis director without ABIM Nephrology certification.

Fewer opportunities are available for faculty positions at teaching institutions because they require the approval of the credentialing committee to accept a physician without board eligibility, as well as for the reasons stated above.

Recommendations to help this vulnerable group of physicians

- Request that state licensing boards give special consideration to provide permanent or unrestricted licensure following fellowship training for these exceptional pathway candidates.
- Collaborate with hospital credentialing committees to hire these physicians, especially during times of shortage.
- Apply measures to allow more programs to sponsor H-1B visas (allowing US employers to temporarily employ foreign workers in specialty occupations) for internal medicine residents and fellows instead of J-1 visas to eliminate the need for a J-1 waiver.
- Present better data as to how many trainees in nephrology have entered the exceptional pathway (a de novo US nephrology fellowship without US internal medicine residency training), and clarify what their outcomes are.
- Allow these exceptional pathway fellows who complete an ACGME-accredited nephrology fellowship to become ABIM Nephrology eligible immediately after completion

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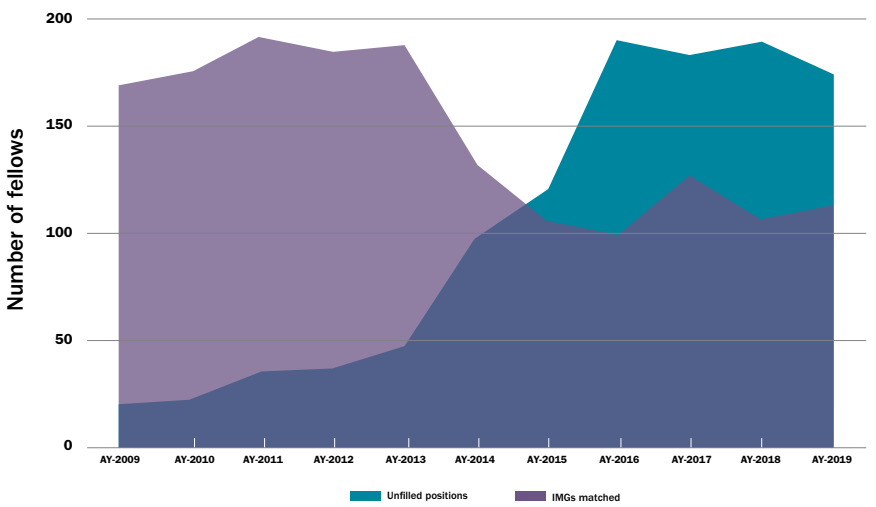
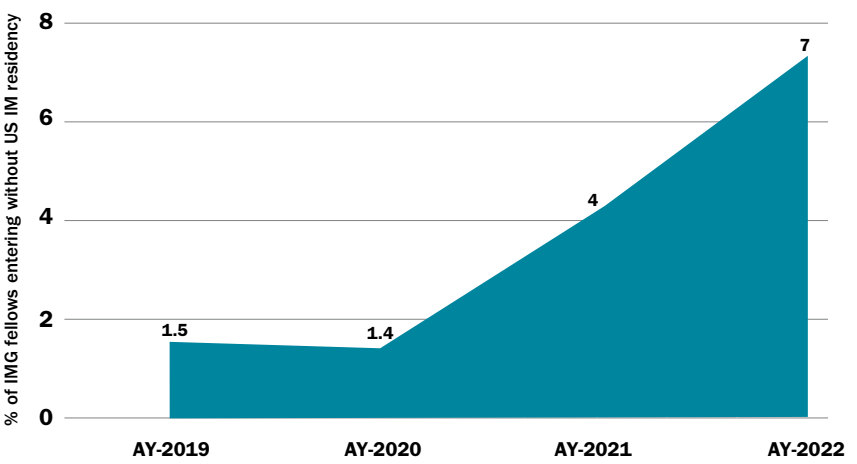
Figure 1. The decline of IMGs in nephrology parallels the rise in unfilled fellowship positions



Data from Pivert (5). AY, appointment year.

Figure 2. Percentage of IMG fellow respondents entering without US IM residency



Data from ASN Data Subcommittee (9). AY, appointment year; IM, internal medicine.

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of the fellowship and not wait until 3 years in a teaching hospital under Special Consideration Pathway A of ABIM (19).

The results of the fellowship match show that nephrology needs talented doctors who are genuinely interested in working in the field. The nephrology community needs to provide a secure pathway to allow for future practice after fellowship for exceptionally qualified physicians because they are filling those voids to some extent. This may potentially shift the game for the future nephrology workforce as well as the US health care system by encouraging more physicians with foreign training to pursue this pathway in the future. ■

Sujith Kumar Palleti, MD, is a nephrology fellow with Loyola University Medical Center, Maywood, IL.

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Practices Face Triple Whammy

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spending by reducing spending in other areas.

As for the great resignation, a record 4.5 million employees had quit their jobs by the first quarter of 2022, and there were 11.5 million job openings—the highest on record—according to the US Bureau of Labor Statistics. Americans continued leaving jobs throughout the year, with another 4.2 million quitting in November 2022, providing plenty of job opportunities for employees, yet challenges for employers.

At the Virginia Nephrology Group (VNG), Managing Partner and President Renuka Sothinathan, MD, has never seen hiring challenges like this in her 22 years in practice. VNG has 10 physicians, three locations, and 20 dialysis clinics in Northern Virginia. The practice has increased salaries for support staff by 60% over the past few years and still finds it difficult to hire people. "It's hard to get anybody to turn up for an interview," Sothinathan said. "Then you'll offer them the position, they say yes, then they don't show up for the job or at the last minute say they're not coming." This new reality has been going on for 3 or 4 years, she said, but it has been escalating. "In the last year, it was just the worst."

Patients are noticing the outcomes from having a reduced staff too. "We can't find staff, and there [are] increased demands from patients. So, sometimes half the visit is calming the patient down because [the patient says], 'nobody's answering your phones,'" Sothinathan explains. She has started being direct with patients and asking if they know anyone who might be good job candidates.

Sothinathan said the United States should consider reevaluating the limit on legal immigrants, pointing out that vetted and approved immigrants could help fill jobs that Americans may not want. Canada is doing just that. The Canadian government announced in November 2022 that it plans to increase its immigration efforts to fill its labor shortage, particularly in health care, skilled trades, and information technology. Similar efforts have failed in the US Congress.

Ways to help nephrology practices

Although physicians may feel helpless at reducing inflation or solving the nation's labor shortages, there are some business strategies and tactics they can implement to fight rising prices. Practices can negotiate with payers, improve their billing, examine creative ways to cut costs, and outsource services to try to stay ahead of inflation, said Nathaniel Arana, founder and chief executive officer of NGA Healthcare, a health care consulting firm that negotiates contracts with payers for physician practices. "In medical practices and surgery centers, inflation is a major, major issue," Arana said. "The majority, if not all other businesses, are able to increase their rates when there's inflation,…[but] medical practices and surgery centers are bound by payer contracts. So, the only way that they can increase their rates is by negotiating with insurance companies."

Arana acknowledged that this could be a long process but said negotiating is doable, either by the practice or through hiring a consultant to do the analysis and negotiating. First, a practice needs to understand exactly what it's getting paid by an insurance company and then compare that with Medicare and other insurance companies. For example, if Insurer A is paying 110% of Medicare, but Insurer B is paying 80% of Medicare, "that gives us an understanding or an idea that there is a potential to go to 110[%]," Arana said, "because one of the payer's competitors is paying that high so it seems like the market can bear that rate."

Once it knows what rate increase it plans to ask for, a practice "needs to create a compelling story about why [it] deserve[s] an increase," Arana said. The practice should think about ways it is saving the insurer money, such as being able to reduce or prevent more expensive emergency room admissions.

Although it likely does not make sense for a smaller practice to hire a full-time person to negotiate contracts, Arana said, it is a skill to keep in mind when hiring new staff. "If you were hiring for an administrator, for example, and you came across one who has done [contract negotiations] several times for [his or her] previous positions, then that's obviously going to be a positive return on investment."

Focus on billing

Medical practices should have billing personnel who are keeping up with billing and going after every penny. "You have to ensure that the [billing staff] is following up, not just accepting claims denials at face value…with the insurance company," Arana said. "In addition to that, there's a patient cost-share that often isn't collected at the time of service. It's always a better practice when the patient shows up and [the practice has] a balance to ask to collect from the patient because that can really affect the practice's margins."

The Kidney Experts recently focused on billing, replacing the entire billing team last year after realizing it was not up to date on collections. "We were not getting the support that's needed to be able to do the billing correctly," Shree Mulay said. "So, right now, we're having to take time out and it's all hands on deck to try and figure out our billing situation. If your billing is not right, even if you're doing the services, providing the care, and the value, you will not be paid for it correctly."

To outsource and potentially cut costs, practices should examine every service and item for which they are paying, Arana said. "We live in an era where we tend to put everything on autopay and forget to even review what we are being charged, for the many services we require as a business," he said. "This is where it is key to have financial reports every month that list all your business services."

Areas to examine include internet service providers, email hosting providers, and clinical and administrative supplies providers. Areas to consider for outsourcing include medical billing, credentialing, prior authorizations, and recruiting. Shree Mulay said that it is incredibly challenging to look for ways to cut costs and that changes often require new investments. "It's so easy in theory to talk about what to do, but it can be a challenge to implement because that requires organization and increased complexity," he said.

Shree Mulay and his leadership team have a daily huddle with their entire staff, where they discuss changes and inefficiencies. "We're continuously trying to improve things," he said, "and I think over time, our services continue to improve. Everyone's a part of the process. Now, everyone's engaged, so I think there are a lot of opportunities." ■

Advocating for Policy Changes to Improve Kidney Care in 2023

Protecting kidney care and funding kidney research are crucial for the 37 million Americans living with kidney diseases and the more than 800,000 living with kidney failure. With the 118th Congress confirmed and the Biden administration entering its third year, ASN is advocating for must-pass legislative and regulatory priorities, building off past efforts to educate and build support among policymakers.

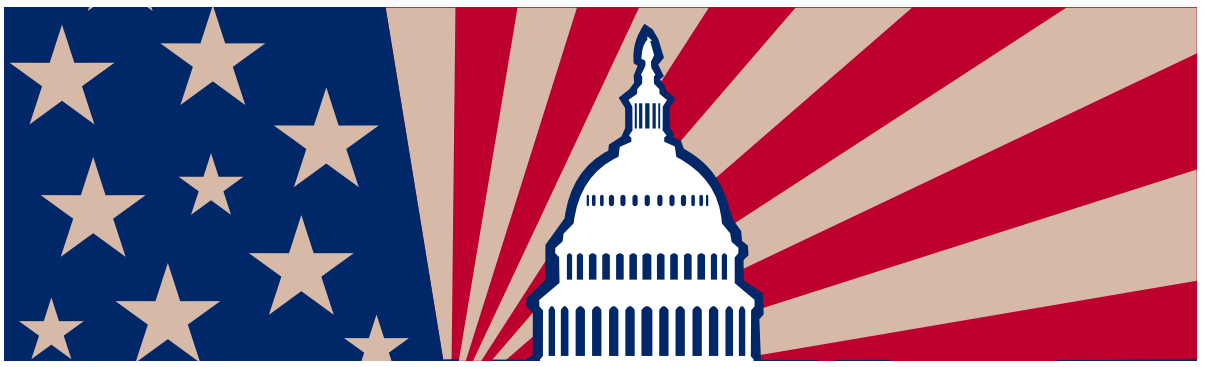
ASN is leading efforts to improve care for people with kidney diseases by raising the profile of kidney health in the federal government by engaging policymakers in Congress and within the US Department of Health and Human Services. In 2021, ASN launched the We're United 4 Kidney Health campaign (www.4kidneyhealth.org) to galvanize and educate the kidney community about the "dramatic changes and new opportunities taking place in kidney care, research, and education…." The campaign, structured from four key priorities—Intervene Earlier, Transform Transplant, Accelerate Innovation, and Achieve Equity—has driven awareness about kidney diseases and alignment on strategies to improve kidney health. These priorities will continue to inform ASN's advocacy efforts with Congress and the Biden administration. In 2023, ASN will support these priorities by expanding patient choice in care, continuing efforts to build stability in physician payment, and accelerating innovation among numerous other activities.

Key legislative priorities

ASN is continuing to engage Congress on the health coverage gap created by a change in the Medicare Secondary Payer policy. In a June 2022 decision, the US Supreme Court in *Marietta Memorial Hospital Employee Health Benefit Plan v. DaVita Inc.* created a pathway for insurers to provide drastically reduced benefits to people with kidney failure, such as below-cost reimbursement of services and network exclusion, thereby encouraging premature enrollment in Medicare and limiting access to private insurance for people with kidney failure. Prior to the Supreme Court decision, Medicare protected people with kidney failure to access private insurance for 30 months after qualifying for Medicare coverage. This transition period allowed a more seamless transfer to public insurance, maintained patient choice in care coverage, and protected dependents' access to medical care. Although Congress did not include a fix for this coverage gap in its end-of-year package, ASN will continue to prioritize a fix for this gap by advocating for patient choice in their care. ASN encourages kidney health professionals and kidney patients through ASN's Legislative Action Center (https://www.asn-online.org/policy/lac.aspx) to amplify these concerns with their local delegates.

At the end of 2022, ASN collaborated with the broader health professional community to secure a compromise deal avoiding drastic physician payment cuts within Medicare. It was projected that on January 1, 2023, kidney health professionals would face a 4.5% conversion factor cut in Medicare Part B reimbursement, resulting from updates from the Centers for Medicare & Medicaid Services (CMS). However, with advocacy from ASN members, Congress reduced the size of the looming cut, implementing only a 2% physician payment cut, which will transition to 3% in 2024. These cuts are less harmful than what was originally proposed but still present an obstacle for ASN members for obtaining reimbursement reflective of the care they provide to people living with kidney diseases. ASN will continue to advocate for these payment cuts to be addressed and future scheduled cuts to be averted.

In 2018, ASN launched Kidney Innovation Accelerator (KidneyX; https://www.kidneyx.org/), a public-private partnership to accelerate innovation in the prevention, diagnosis, and treatment of kidney diseases. Since then, KidneyX has supported nearly 70 innovators with solutions ranging from dialysis-accessible clothing to prototype artificial kidneys. Furthermore, KidneyX is also catalyzing private markets to support innovation in kidney health. For instance, winners of the first KidneyX competition—Redesign Dialysis—with a total prize purse of $4.125 million, have gone on to raise more than $300 million from private funders. In 2019, Congress demonstrated its commitment to accelerating innovation for people living with kidney diseases by providing KidneyX its first $5 million. Congress has continued its support of KidneyX by providing an additional $5 million each year through annual appropriations, now totaling $20 million and nearly matching ASN's initial $25 million contribution to KidneyX. However, increased support from Congress for KidneyX and other efforts to accelerate innovation is needed to foster the development of the artificial kidney and other advancements in kidney health. ASN is advocating for Congress to provide KidneyX $25 million in fiscal year 2024, the current fiscal year, to accelerate advancements such as the artificial kidney.



Key regulatory priorities

ASN will continue to engage CMS to address greater equity in the Medicare End-Stage Renal Disease (ESRD) program, increase quality efforts in home dialysis, support payment for innovation in kidney care, and bring balance to payments in the ongoing COVID-19 public health emergency.

In August 2022, CMS released the proposed rule for the 2023 ESRD Prospective Payment System (PPS), Payment for Renal Dialysis Services Furnished to Individuals with Acute Kidney Injury (AKI), ESRD Quality Incentive Program (QIP), and ESRD Treatment Choices (ETC) model. This proposed rule builds on policies that were finalized in the previous year's rule that sought to improve health equity and enhance access to treatment. This year's final rule continues to have a strong focus on home dialysis.

In this year's proposed rule, CMS:

- sought public comment on numerous requests for information on a potential add-on payment adjustment for certain new renal drugs and biological products and on health equity issues with a focus on pediatric patients.
- proposed an update to the ESRD base rate, wage index, and outlier policy for calendar year (CY)2023. CMS also proposed the addition of the word "functional" to the definition of "oral-only drug." Furthermore, functional category definitions were clarified.
- included numerous updates to the ESRD QIP, which included the suppression of certain payment measures from CY2023 and updates for subsequent payment years. CMS also sought comment on potentially adding quality measures. Despite CMS's effort to support patient access to home dialysis, ASN was disappointed by the organization's silence on the topic of home dialysis for patients with AKI. ASN reiterates that it remains dedicated to ensuring the success of all patients with AKI and in doing so, will continue to push for CMS to allow for a treatment pathway and reimbursement program for treatment of AKI with home dialysis in the coming year.

In 2022, ASN stressed that the current payment-adjustment system for the ESRD PPS is not elastic enough to deal with the strong inflationary forces and real-time staffing crisis facing dialysis providers today. ASN will continue to advocate for policies that positively address this issue. CMS also finalized a proposal to apply a permanent 5% cap on decreases on the ESRD PPS wage index beginning in CY2023.

In November 2022, ASN and the National Kidney Foundation (NKF) sent a letter to the US Food & Drug Administration (FDA) Commissioner Robert M. Califf, MD, offering to help cultivate the growing interest in therapeutic developments to benefit individuals with kidney diseases (1). In the letter, ASN and NKF discussed the need for therapeutic development and innovation to target kidney diseases and offered several approaches to ensure these patients receive valuable access to care. One of these approaches offered bringing the expertise of the kidney community to the FDA in the development of safe and effective therapies across the spectrum of kidney care through the Kidney Health Initiative (https://khi.asn-online.org/). The letter also urged the FDA to take measures to ensure that participants in clinical trials designed for people living with kidney diseases accurately reflect the patient population in terms of race and socioeconomic status. ASN will continue advocating for this issue this year.

To keep track of ASN's efforts to intervene earlier, transform transplant, accelerate innovation and expand patient choice, and achieve equity, and to learn more about ASN's 2023 policy agenda, follow coverage in *Kidney News* and the ASN podcast feed (https://www.asn-online.org/media/podcast.aspx?p=ASN), and visit the ASN Advocacy and Public Policy webpage (https://www.asn-online.org/policy/). For real-time updates, follow ASN policy on Twitter (@ASNAdvocacy).

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ASN Executive Vice President's Update

Implementing 10 Recommendations to Help Forge the Future of Nephrology

By Tod Ibrahim

Nearly 50 years to the day after former President Richard M. Nixon signed the Social Security Amendments of 1972 into law (Public Law 92-603) establishing the Medicare End-Stage Renal Disease Program, the ASN Task Force on the Future of Nephrology issued its final report (1, 2). Due to deadlines from external regulators, the task force had less than 1 year to reach consensus and issue recommendations to help shape the specialty's future.

Given the task force's tight timeframe, the final report focuses on the "why" and the "what" of its 10 recommendations, not the "how." This editorial outlines how ASN will work with the kidney community and other stakeholders to implement these recommendations.

Responding to requests from the American Board of Internal Medicine (ABIM) and the Accreditation Council for Graduate Medical Education (ACGME) about training requirements in nephrology, ASN established the Task Force on the Future of Nephrology in April 2022. ACGME accredits sponsoring *institutions* as well as participating residency and fellowship training *programs*, while ABIM (one of the American Board of Medical Specialties' 24 specialty boards) certifies and recertifies *individuals* (general internists, hospitalists, and internal medicine subspecialists, including nephrologists).

To receive Medicare funding for medical education, an institution's residency or fellowship programs must be accredited by ACGME. Through Medicare, the federal government pays more than $16 billion annually for medical education (3). Starting July 1, 2023, ACGME will also become responsible for overseeing J-1 visa holders in nonaccredited fellowship programs (such as transplant nephrology); because these programs are not accredited by ACGME, they are not eligible for federal educational funding through Medicare (4).

In January 2022, ACGME initiated its 10-year review of fellowship program requirements for the 17 internal medicine subspecialties, including nephrology. As a part of this process, ACGME requested ASN's input on nephrology fellowship training program requirements. At the same time, ABIM requested ASN's perspective on whether current procedural requirements for certification in nephrology should be reduced, maintained, or expanded. For years, ABIM, nephrology fellowship training program directors, nephrology fellows, and other stakeholders have debated this topic (5–7).

ASN sent ACGME and ABIM a joint letter in March 2022 requesting 8 months to establish a task force, engage the kidney community to consider all aspects of the future of nephrology, and determine how to best prepare nephrology fellows for future opportunities and challenges (8). After an intense 8-month process that included weekly videoconferences, discussions with advisors from ABIM and ACGME, constituency-specific interactions with the kidney community and other stakeholders, and an analysis of available data, the task force issued an interim report in September 2022. Based on feedback on the interim report from ASN members, other organizations—including the American Society of Transplantation, National Kidney Foundation, and Renal Physicians Association (RPA)—and key stakeholders, the task force revised the recommendations and issued its final report.

In its final report, which has been submitted for peer-reviewed publication, the task force makes 10 recommendations to help forge the future of nephrology (Table 1). To begin to implement these recommendations, ASN is pursuing four steps.

Table 1. 10 Recommendations to help forge the future of nephrology

1.	Enhance competency-based nephrology education.
2.	Establish individualized pathways to meet career goals.
3.	Emphasize personalized care.
4.	Reconsider expectations for training in procedures.
5.	Close gaps in current nephrology training.
6.	Promote the well-being of nephrology fellows.
7.	Prioritize diversity, equity, inclusion, and health care justice.
8.	Ensure equal opportunities for all nephrologists.
9.	Foster interprofessional and interdisciplinary practice.
10.	Inspire lifelong learning.

Revise expectations for procedural training

During its reorganization in the 2000s, ABIM established 14 specialty advisory boards and committees "responsible for the broad definition of the discipline across Certification and Maintenance of Certification (MOC)" (or recertification) (9). Chaired by Rudolph A. Rodriguez, MD, ABIM's Nephrology Board is expected to deliberate task force Recommendation 4 to "reconsider expectations for training in procedures" this spring.

According to the task force, "All fellows must have the knowledge, skills, values, and attitudes to make decisions about the indications for both performance and complications of placement of temporary vascular access for hemodialysis and percutaneous biopsy of both autologous and transplanted kidneys." To accomplish this goal, ASN has requested that ABIM and ACGME remove requirements for training in the placement of temporary vascular access for hemodialysis and percutaneous kidney biopsy. While some nephrology fellowship programs may still decide to provide training to competence in these procedures, the task force asserts that such training should not be required, although all fellows should be afforded an opportunity to train in these procedures if interested.

Chaired by Robert S. Hoover, Jr., MD, FASN, the ASN Workforce and Training Committee is responsible for working with ABIM and ACGME to try to make this change and for supporting nephrology fellowship training programs implementing any new policies in this arena. If the ABIM Nephrology Board agrees to "reconsider expectations for training in procedures" this spring, Stephen M. Sozio, MD, MS, FASN, who serves as the committee's co-vice chair, will lead members of the committee in identifying resources, tools, and talking points to support the 150 ACGME-accredited nephrology training programs' transition to the new requirements (10).

Respond to ACGME's proposed changes to the next iteration of the fellowship training program requirements in nephrology

Currently, ACGME's Review Committee for Internal Medicine (RC-IM) is sharing proposed changes to the next iteration of fellowship training program requirements for several of the internal medicine subspecialties, such as cardiology. The ASN Workforce and Training Committee will identify which of these suggested changes could appear in forthcoming nephrology program requirements later this spring.

Led by Ursula C. Brewster, MD, who serves as the committee's co-vice chair, ASN will also begin to evaluate existing nephrology fellowship training program requirements against the task force's recommendations to identify opportunities to strengthen or change current requirements. For example, ASN should advocate that the program requirements "emphasize personalized care" (Recommendation 3); "promote the well-being of nephrology fellows" (Recommendation 6); "prioritize diversity, equity, inclusion, and health care justice" (Recommendation 7); and "inspire lifelong learning" (Recommendation 10).

In the coming months, ACGME's RC-IM will propose changes to fellowship training program requirements for the remaining internal medicine subspecialties, including nephrology. Besides providing a thorough response to these proposed program requirements, ASN will identify opportunities to support ACGME-accredited nephrology fellowship training programs with the anticipated changes. The new requirements are expected to go into effect no sooner than July 1, 2024.

Build a framework to support competency-based education in nephrology

Accomplishing three of the task force's first five recommendations will require considerable alignment, coordination, and commitment across ASN:

- Enhance competency-based nephrology education (Recommendation 1). "Nephrology must enhance its approach to competency-based education by defining and standardizing three levels of competency across nephrology fellowship training programs."
- Establish individualized pathways to meet career goals (Recommendation 2). "Nephrology must establish individualized pathways to provide opportunities for fellows to explore advanced specialized care and other career goals in more depth."
- Close gaps in current nephrology training (Recommendation 5). "Nephrology must emphasize personalized care to optimize kidney health, including early intervention to slow CKD [chronic kidney disease] progression and increase patient choice regarding transplantation, dialysis, and conservative care."

To accomplish these goals, ASN plans to establish an oversight task force that includes members from the ASN Workforce and Training Committee and the ASN Continuous Professional Development Committee, which is chaired by Karin A. True, MD, FASN. According to the task force, competency-based education in nephrology will consist of three levels:

1. Level I includes the expected knowledge, skills, values,

and attitudes of every graduating nephrology fellow. In all likelihood, this training would occur during the first 12 months of a 2-year nephrology fellowship.
2. Level II includes training beyond general nephrology that provides fellows with opportunities to perform advanced procedures or clinical care. This training would likely occur as an elective during the second 12 months of a nephrology fellowship.
3. Level III includes a higher degree of proficiency that offers distinct career opportunities in specialized areas of nephrology. Transplant nephrology, for example, would likely continue to occur during an additional year of nephrology fellowship. As previously noted, federal funding for additional training would require accreditation by ACGME.

At a more granular level, ASN will need to define a consistent taxonomy, lexicon, and terminology in nephrology; inventory and publicize current offerings for individualized pathways at ACGME-accredited training programs; ensure the updated fellowship training program requirements meet the objectives for Level I competency; and coordinate with existing initiatives (by ASN, such as the society's Home Dialysis Task Force, or by other members of the kidney community) to develop necessary curricula for high-priority gaps in nephrology.

Recently, ASN made two operational changes to help facilitate these efforts. First, every element of planning for ASN Kidney Week was separated from the society's other educational efforts, such as the ASN Board Review Course & Update, nephSAP (the Nephrology Self-Assessment Program), or KSAP (the Kidney Self-Assessment Program). This separation ensures educational independence for Kidney Week to continue featuring scientific and clinical excellence as well as allows ASN to better coordinate all of its other educational offerings in alignment with the task force's recommendations. Second, ASN has suspended all efforts to develop curricula (and related activities) until the new oversight task force has time to organize.

Strengthen the health care workforce in nephrology and address current workforce challenges

In its final report, the ASN Task Force on the Future of Nephrology dedicated two of its 10 recommendations specifically to strengthening the health care workforce in nephrology:

- Ensure equal opportunities for all nephrologists (Recommendation 8). "Nephrology must work toward ensuring all nephrologists—including allopathic, osteopathic, international medical graduates (IMGs), and US-IMGs—have equal opportunities in the United States."
- Foster interprofessional and interdisciplinary practice (Recommendation 9). "Nephrology must emphasize the importance of interprofessional and interdisciplinary practice that involves all members of the health care team in the care of people with kidney diseases." According to the task force, the interprofessional kidney care team should include advanced practice providers, care managers, community health workers, dietitians, nephrologists, nurses, occupational therapists, pharmacists, physical therapists, psychologists, researchers, social workers, and others as appropriate to the needs of the patient and family.

Representatives from the ASN Policy and Advocacy Committee (chaired by Roslyn B. Mannon, MD, FASN), Quality Committee (chaired by Scott D. Bieber, DO), and Workforce and Training Committee have been working with the society's staff to discuss ways to strengthen the health care workforce in nephrology and address current challenges to the nephrology workforce. In addition to helping implement the task force's two recommendations, this advisory group must work with the rest of the kidney community—especially organizations like the American Nephrologists of Indian Origin, American Nephrology Nurses Association, and RPA—to:

1. Overcome shortages of nephrologists and other health professionals, particularly nephrology nurses caring for dialysis patients, throughout the United States.
2. Support IMGs, who represent 50.5% of the 11,407 nephrologists currently in practice in the United States (11).
3. Expand access and optimize the way kidney care is delivered.
4. Address the paradox between current and future shortages of nephrologists and other nephrology health professionals versus the need to right-size the number of nephrology fellowship training positions (12, 13).
5. Ensure work-life balance, address burnout, and provide high-quality kidney care, especially after nearly 3 years of the COVID-19 pandemic (14).

Both the task force and this advisory group have agreed that addressing concerns about the research workforce in nephrology will require an entirely separate, dedicated, and well-resourced effort. ASN should pursue such an undertaking as soon as possible, perhaps working directly with organizations such as the Association of American Physicians, The American Society for Clinical Investigation, and the American Physician Scientists Association.

In closing, I invite every member of the kidney community to thank the members of the task force, ABIM and ACGME advisors, ASN staff, and the individuals and organizations who contributed to the interim and final reports (15). Specifically, I commend former ASN President Mark E. Rosenberg, MD, FASN, and ASN Senior Director of Strategic Relations and Patient Engagement Melissa R. West for chairing and administering the task force, respectively. They were heroic. ■

Tod Ibrahim, MLA, is Executive Vice President, American Society of Nephrology, Washington, DC. You can reach him at tibrahim@asn-online.org.

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Are you a fellow with a tip or idea you'd like to share with your fellow peers and the broader kidney community?

Send your idea to the ASN *Kidney News* Fellows First column at kidneynews@asn-online.org

Kidney News Introduces New Editorial Fellows, Showcases Their Ideas for Improving Training in Nephrology

In late 2022, two nephrology fellows were selected to join the ASN *Kidney News* Editorial Fellows Program for 2-year terms: Rasha Raslan, MD, Duke University, and Paul Hanna, MD, Massachusetts General Hospital/ Brigham and Women's Hospital, combined Harvard Medical School program. As part of the application process, they were asked to write a short article about the topic, Training in Nephrology 2023: What Can Be Changed?

We welcome Drs. Raslan and Hanna to the *Kidney News* editorial team and invite you to read their winning articles here.

Training in Nephrology 2023: What Can Be Changed?

By Rasha Raslan

As the only person in my residency class who was applying to nephrology, I have often wondered why many others did not seem as interested in the same specialty. A survey of fellows from different subspecialties other than nephrology showed that "the subject matter being too difficult" was cited as a common reason for not choosing this specialty (1). Although the pre-clinical years of medical school are heavily focused on physiology and cellular pathology, residency medical education is not. Nephrology is a field that is steeped in physiology and if not taught correctly, may deter residents from pursuing it as a future career.

Nephrology is also not heavily tested on board exams. According to the yearly American Board of Internal Medicine exam blueprint, nephrology (combined with urology) makes up 6% of topics tested compared with 14% of cardiology content (2). Also, unlike certain other specialties, nephrology is not a required rotation for many internal medicine residents. My goal is to create a formal curriculum for residents who rotate on nephrology services that will teach them how to apply physiology into daily practice. For example, the topic of hyponatremia can be taught by using clinical cases, with an emphasis on pathophysiology before delving into diagnosis and management. Physiology retreats, such as the one I helped organize during my chief residency year at Virginia Commonwealth University, and the ASN Kidney Tutored Research and Education for Kidney Scholars (TREKS) program are unique ways to re-introduce and solidify physiology concepts into residency training. They allow participants to pose scientific questions related to clinical scenarios they had encountered in their daily practice and to then answer them using basic scientific experiments. This can be done at an institutional or national level, for example, by making the Kidney TREKS program available to residents, as well as medical students.

Nephrology training would benefit from revitalizing the way we teach core physiological concepts. By reminding trainees of the scientific process of making and testing hypotheses, this could not only increase their appreciation of medicine but also lead to innovation and overall better patient care. ■

Rasha Raslan, MD, is a first-year nephrology fellow at Duke University and plans to pursue a career as an academic nephrologist to care for patients with kidney diseases in both in-patient and out-patient settings. She is also interested in incorporating medical education into her career. She believes in the importance of teaching sound principles of physiology to incorporate into the daily care of patients. During her chief year, she was involved in organizing her residency's biannual Immersion in Physiology Course. This was a 5-day retreat where residents posed scientific questions related to clinical scenarios they had seen on wards and then set out to answer them using basic scientific experiments.

The author reports no conflicts of interest.

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Training in Nephrology 2023: What Can Be Changed?

By Paul Hanna

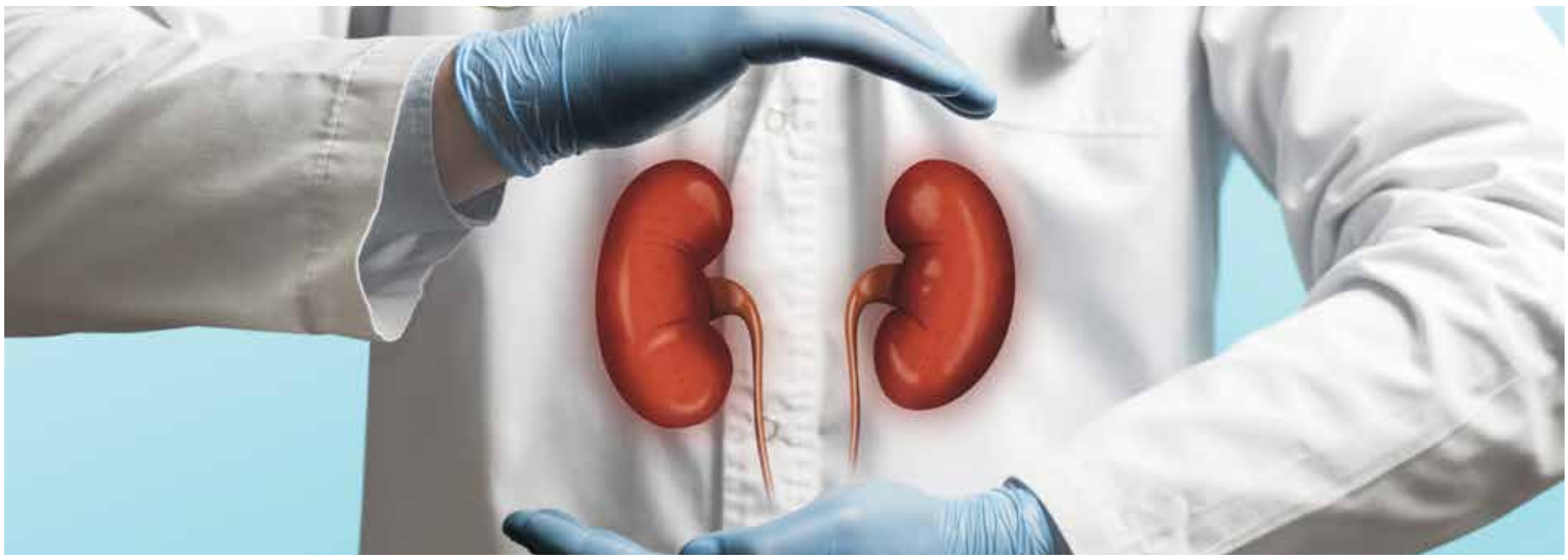
Over the past decade, there has been an incredible interest in reforming nephrology owing to multiple factors. Perhaps the most important factor is the slow decline in the number of nephrology trainees over the past few years, along with the dire need for well-trained nephrologists during the recent COVID-19 pandemic. This signals a much deeper concern about how we recruit, develop, and retain candidates. In the next few lines, I will outline some intriguing ideas to transform how nephrology training could adapt.

1. Nephrology, as a specialty, is evolving to be more evidence based and protocol driven than ever before. Thus, routine dialysis orders and monthly labs should be protocolized by support health care providers to devote nephrology trainees' time to higher-level critical thinking and planning (e.g., goals of care discussions, access creation, home dialysis transition, mineral/bone disease management, and workup of anemia).
2. Teaching conferences should be tailored to learning styles of trainees (residents and fellows) via online modules, recorded lectures, question banks, and case-based discussions. Frequent iterations of cannot-miss diagnoses and management of acute kidney dysfunction are key to better digestion of nephrology topics that may be off-putting to potential candidates.
3. Most nephrology fellowship programs unfortunately lack balanced exposure to all that a nephrologist does or can do. Exposure to various research methods and study techniques is equally as important as building clinical acumen for dealing with glomerular diseases, onconephrology, and dialysis emergencies.

In conclusion, training in nephrology in 2023 should offer a balanced making of a well-rounded nephrologist, clinician, educator, and scientist. ■

Paul Hanna, MD, is a third-year nephrology fellow with the Massachusetts General Hospital/ Brigham and Women's Hospital combined Harvard Medical School program, Boston, MA. He has a deep clinical interest in onconephrology and digital media in medical education and received his MD from the Medical College of Wisconsin with Honors in Research Distinction for his work on sodium glucose cotransporters.

The author reports no conflicts of interest.



Organ Transplantation Using SARS-CoV-2-Positive Deceased Donors

By Manal Alotaibi and Sam Kant

The coronavirus disease 2019 (COVID-19) pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has affected many aspects of organ transplantation. The decision to use a SARS-CoV-2-positive donor has remained controversial. Guidelines for organ donation in the setting of respiratory viral infections, such as influenza, exist with a recommendation to proceed with donation from influenza-infected donors only after they have been treated with antiviral therapy and have no further evidence of influenza in the lower airways. In addition, recipients of any organs from donors with influenza infection should receive a full therapeutic course of antiviral treatment (1, 2). Several reports have previously recommended against using SARS-CoV-2-infected organ donors over concerns of transmission by blood or allograft tissue, donor organ damage, a lack of effective therapies, health care worker exposures, and hospital resource utilization (3, 4). Nevertheless, a few cases, using low-risk donors known to be actively infected with or recovered from SARS-CoV-2 infection, have reported good early outcomes, albeit with extremely short follow-up periods (4–7).

Bock et al. (8), in the *American Journal of Transplantation*, conducted the largest retrospective cohort study to date using the Organ Procurement and Transplantation Network (OPTN) database (from March 15, 2020, to September 30, 2021) of patients undergoing solid organ transplantation from deceased donors with positive SARS-CoV-2 nucleic acid test (NAT) results. The dataset does not specify when this test result occurred, whether it was the first, most recent, or during donor evaluation.

Only donors with SARS-CoV-2 NAT results were included; of those, 150 donors (of 17,694 total donors) had positive SARS-CoV-2 NAT results. Of these, 124 donors had at least one organ transplanted with a total of 276 organs transplanted; 269 of them were matched to recipients in the appropriate datasets and comprised the study cohort. Transplants included 187 kidneys and five kidney-pancreas cases. There were four deceased pediatric donors, from which seven kidneys were transplanted, all into adult recipients. Three pediatric recipients received organs (two kidneys and one heart) from deceased adult SARS-CoV-2 NAT-positive donors. The cause of death in SARS-CoV-2 NAT-positive donors was due to anoxia in 33.8%, cerebrovascular disease or stroke in 20.8%, head trauma in 30.5%, other causes in 7.4%, and COVID-19 infection in 7.4%. There was no available information on those donors who did not proceed with organ recovery.

The primary endpoint was patient death across all organs, with secondary endpoints including patient death stratified by transplanted organ and graft failure across all organs. The data showed that graft survival for those receiving organs from SARS-CoV-2-positive deceased donors was equivalent to the survival of those receiving organs from SARS-CoV-2-negative donors, with no difference in actuarial survival between the two groups. The 30-day posttransplant patient-survival rates were similar. There were eight graft failures and five deaths, with two in the kidney transplant group. The first patient died due to respiratory failure at 109 days posttransplant, without providing a specific cause of respiratory failure in the article. The cause of death in the second patient was unknown. There were three graft losses in the kidney transplant group due to graft thromboses in two patients and recurrent disease in the third. The outcome was reached with a median 83-day follow-up time.

The results are encouraging, given the large sample size using the OPTN database—this is largest study in recipients receiving organs from SARS-CoV-2-positive deceased donors. Even though it has been recognized that transmissibility of the SARS-CoV-2 infection to recipients is low in the setting of organ donation, there is no reporting of transmission rates. In addition, the study lacks specific data regarding the severity of donor SARS-CoV-2 infections or organ involvement, the timing of SARS-CoV-2 infection, therapies such as remdesivir or monoclonal antibodies, and donor and recipient vaccination statuses. Information regarding the NAT cycle threshold is absent, and follow-up duration remains short. Additionally, there was a potential patient-selection bias by the transplant centers. Although death or graft loss was not directly due to SARS-CoV-2 infection, sepsis and respiratory failure in two patients could potentially be due to or influenced by SARS-CoV-2 infection. Additionally, two kidney graft losses and one liver death were attributed to graft or hepatic artery thrombosis, raising concerns of hypercoagulability related to COVID-19.

In summary, it can be tentatively concluded that SARS-CoV-2 status is not associated with worse graft outcomes or with patient survival in the early posttransplant period. Longer follow-up studies are necessary to determine long-term graft and patient outcomes, especially from an era in which vaccination rates are higher, and more potent therapies for COVID-19 are available. Importantly, studies need to elucidate risk and rates of transmission of the virus. Lastly, the instances of graft thrombosis are definitely concerning and do require further exploration if this event is a complication of donor SARS-CoV-2 infection and would involve stratification of recipients at high risk for this deleterious outcome. ■

Manal Alotaibi, MBBS, and Sam Kant, MD, are with the Division of Nephrology, Department of Medicine, and the Comprehensive Transplant Center, Johns Hopkins University School of Medicine, Baltimore, MD.

The authors report no conflicts of interest.

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Cancer Outcome Reporting in Randomized Clinical Trials for Kidney Transplant Recipients

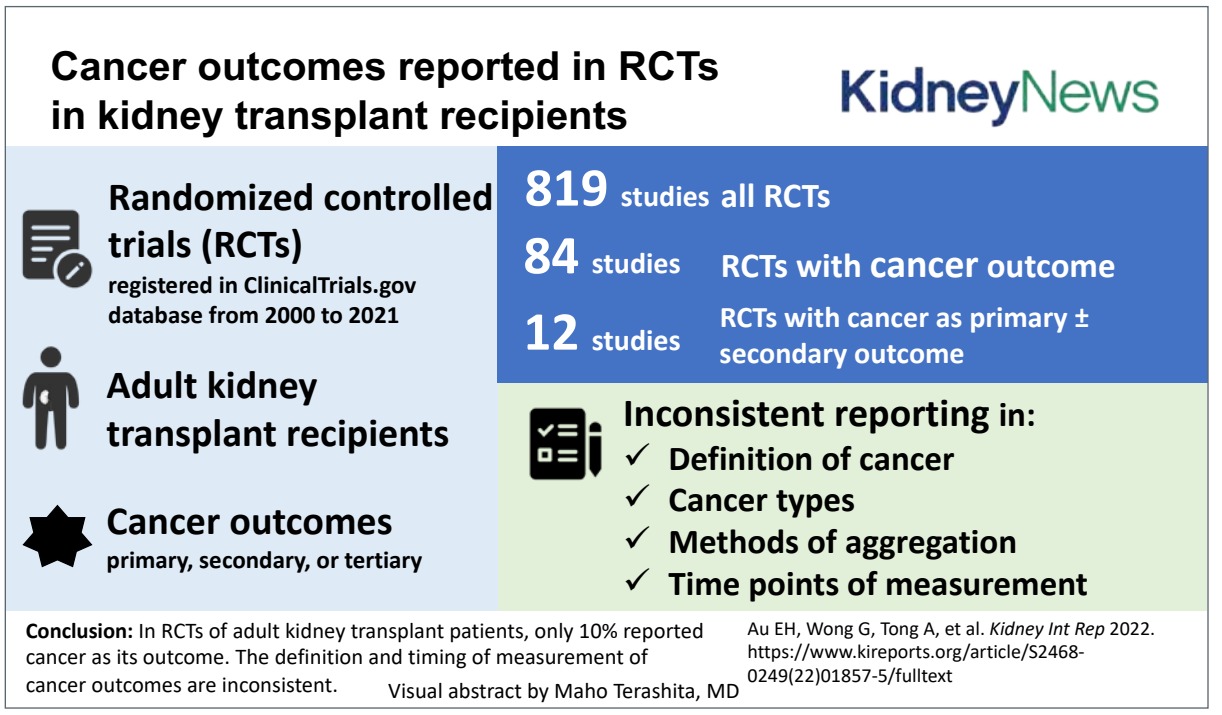
By Maho Terashita and Naoka Murakami

Cancer is a leading cause of death in kidney transplant recipients (KTRs), and the risk of cancer after kidney transplant is four times higher compared with the age- and sex-matched general population (1). However, the mortality and incidence of posttransplant cancer have not improved for the past three decades (2), leaving a considerable gap in clinical care. While cancer is identified as one of the six core outcomes for trials by the Standardized Outcomes in Nephrology-Transplantation initiative (3), the reporting of posttransplant cancer remains inconsistent.

In a recently published article in *Kidney International Reports*, Au et al. (4) studied the consistency of reporting cancer outcomes in 819 randomized controlled trials (RCTs) targeting KTRs that were registered in ClinicalTrials.gov between 2000 and 2021. Only 10% of RCTs enrolling KTRs had cancer as a primary or secondary outcome. In addition, even when reported, the definitions of cancer were variable, and the timing of outcome measurements was mixed. The authors suggested that the standardized reporting of cancer outcomes in KTRs is needed to promote research in this field.

The natural history of posttransplant cancer (i.e., small, absolute risk and long latency) makes it costly to incorporate the cancer outcome as a primary or secondary outcome in RCTs. The TUMORAPA study (5) is one example that examined cancer as a primary outcome. It included 126 KTRs with a follow-up length of 2 years to examine the recurrence risk of non-melanoma skin cancer, comparing immunosuppression regimens (calcineurin inhibitors vs. sirolimus). According to Au et al. (4), 60% of the RCTs focused on induction/early posttransplant immunosuppression, 82% had a short study follow-up period of less than 24 months, and 70% enrolled fewer than 200 patients for the study. These small, short RCTs may not be best suited to evaluate cancer outcomes in KTRs.

How can we better monitor longitudinal cancer burden in KTRs to establish effective screening and diagnostic strategies (6)? The Israel Penn International Transplant Tumor Registry had served this role, but it was discontinued (7). The Transplant Cancer Match Study (8) has so far provided the most comprehensive data by combining the Scientific Registry of Transplant Recipients and state and regional cancer registries, but this lacks key clinical details on cancer treatment history and cancer responses. We call for action to invest the resources to create a cancer-focused transplant registry. ■



Maho Terashita, MD, is with St. Marianna University School of Medicine, Kanagawa, Japan, and Brigham and Women's Hospital (BWH), Boston, MA. Naoka Murakami, MD, PhD, is with BWH, Boston, MA.

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Use of Biomarkers in Immune Checkpoint Inhibitor-Associated Acute Kidney Injury: Is Prime Time Fast Approaching?

By Itunu Owoyemi

The use of immune checkpoint inhibitors (ICIs) in the treatment of various hematologic and solid malignancies has led to better patient survival. The first ICI to be approved in 2011 was the monoclonal antibody-blocking cytotoxic T-lymphocyte antigen (CTLA)-4 ipilimumab. Activation of CTLA-4, expressed on cytotoxic T lymphocytes, results in downregulation of these cells. Ipilimumab turns off this inhibition, resulting in enhanced cytotoxic T cell function, which results in anti-tumor cell activity. This was followed by inhibitors of programmed cell death protein 1 (PD1), such as nivolumab, pembrolizumab cemiplimab, and dostarlimab that block PD1, and atezolizumab, avelumab, and durvalumab that target programmed death ligand 1 (PD-L1). PD1 is a coinhibitory molecule expressed on T cells, and PD-L1 is expressed on the surface of different tissue types, including tumor cells. The ICIs remove inhibitory signals to allow T cell activation and generation of a robust anti-tumor immune response, which also leads to inflammatory side effects in any organ system, often termed immune-related adverse effects (irAEs).

The incidence of acute kidney injury (AKI) associated with ICI therapy (AKI-ICI) is estimated to be 3%–5%, with acute interstitial nephritis (AIN) being the most common histopathologic finding (1, 2). Prompt recognition and reversal of kidney injury with immunosuppressive therapy remain the mainstays for treatment, hence the need for early detection. A late diagnosis contributes to treatment delays and future consideration for ICI rechallenge to address the underlying malignancy (3). The quest

for early diagnosis has led to several research studies to identify risk factors, clinical features, and biomarkers for irAEs. Biomarkers with promising potential for AKI-ICI in two recent studies are summarized in Table 1.

A more recent study by Farooqui et al. (4) evaluated blood, urinary cytokines, and immune cell phenotypes in the peripheral blood of 24 patients in an exploratory study. Fourteen patients with AKI-ICI and 10 patients with non-AKI-ICI were evaluated. Of the 14 patients with AKI, 10 had a kidney biopsy showing AIN (4). The goal of the study was to differentiate AKI-ICI from AKI due to other etiologies without the need of a kidney biopsy. Blood and urine cytokines and immune cell phenotypes in the peripheral blood and tissue of patients on ICI therapy at the time of AKI were obtained. The authors found an abundance of specific immune cells, including CD4 memory, T helper (Th), and dendritic cells in the kidney tissue of patients who developed AKI-ICI. Immunophenotyping also revealed strong expression of tumor necrosis factor α (TNF-α) in kidney biopsies. Urine TNF-α, interleukin (IL)-2, and IL-10 were significantly elevated in AKI-ICI compared with AKI not induced by ICI or healthy controls. The study revealed a strong discriminatory ability of the urine TNF-α level (area under the curve [AUC], 0.814; 95% CI, 0.623–1.00) to detect AKI-ICI. The authors also report a strong expression of TNF-α in kidney biopsies, suggesting that TNF-α originates primarily from the kidney in patients with AKI-ICI with pathology demonstrating AIN. This was in line with a similar biomarker study for a clinical diagnosis of AIN in which urine TNF-α was higher in patients with AIN (5).

Studies on biomarkers for AKI-ICI shed light on mechanistic insights to AKI-ICI. Their results imply that a specific T cell response and respective cytokines may be indicative of AKI-ICI and may differentiate AKI-ICI from other etiologies. There continues to be a need to identify biomarkers for optimal management and safe rechallenge of patients with ICI-associated AKI. As precision medicine in kidney diseases is being advocated, studies such as this on a larger scale should be done to combine knowledge of disease mechanisms to identify subsets of patients who may benefit from specific treatment strategies. ■

Itunu Owoyemi, MBBS, is with the Division of Nephrology and Hypertension, The University of Kansas Medical Center, Kansas City.

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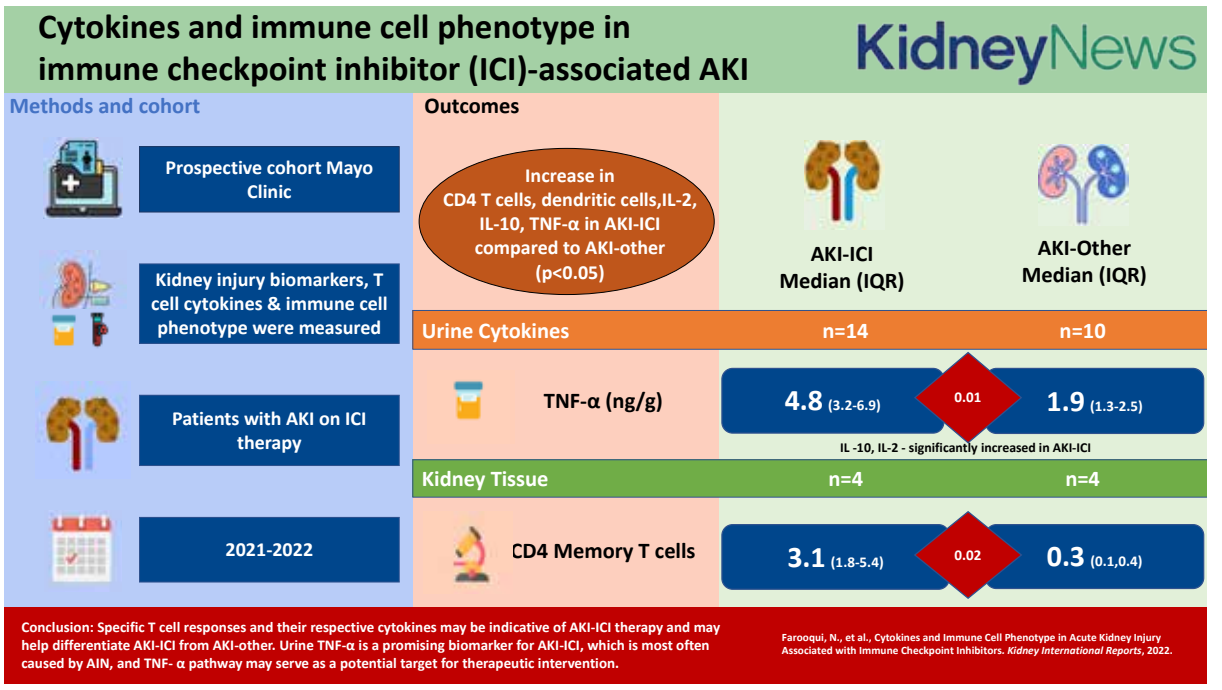

Table 1. Biomarkers with promising potential for AKI-ICI

Study	Isik et al. 2021 (6)	Singh et al. 2022 (7)
Type	Retrospective study on patients with cancer who developed AKI-ICI	Exploratory using NanoString- based gene expression and multiplex 12 chemokine profiling on paired kidney tissue, urine, and plasma specimens
Participants	37 Patients with AKI-ICI and 13 referents with non-AKI-ICI	36 Patients with AKI-ICI
Biomarkers/predictors of AKI-ICI	• Urine retinol-binding protein (uRBP)/creatinine (Cr) ratio • C-reactive protein (CRP)	• Increased T and B cell scores (indicative of the relative abundance of cells in the kidney biopsy tissue) • NanoString analysis was used to identify and determine the abundance of T cell subsets infiltrating the kidneys. • Th1-CD8+ T cell axis accompanied by interferon-γ and TNF superfamily signatures were detected in the ICI-AIN group.
Key outcome	Serum Cr (SCr), CRP, and uRBP/Cr were significantly higher in the AKI-ICI versus the non-AKI-ICI group, median (interquartile range [IQR]): SCr, 2.0 (1.7–2.9) vs. 1.5 (1.3–1.6) mg/dL; serum CRP, 54.0 (33.7–90.0) vs. 3.5 (3.0–7.9) mg/L; and uRBP/Cr, 1927 (1174–46,522) vs. 233 (127–989) μg/g Cr, respectively; $p < 0.05$ for all.	• Upregulation in genes associated with chemokine signaling and significant increases in immune cell scores compared with acute tubular necrosis and hypertensive nephrosclerosis • Urine tertiary lymphoid structures signature correlated with an ICI-AIN diagnosis but not paired plasma. • Urinary CXCL9 correlated best to tissue CXCL9 expression (ρ, 0.75; $p < 0.001$) and the ability to discriminate AIN vs. non-AIN (AUC, 0.781; $p = 0.003$).

An AKI Follow-up Clinic Reduces Mortality—But Not Kidney Events

For hospitalized patients with acute kidney injury (AKI), nephrologist assessment in an AKI follow-up clinic is associated with a reduced risk of death, although no reduction in major adverse kidney events, reports a study in the *American Journal of Kidney Diseases*.

The retrospective analysis included 164 patients who survived a hospitalization with AKI and attended an AKI follow-up clinic at one Ontario, Canada, hospital between 2013 and 2017. Clinic visits occurred within 6 months of discharge. All patients had Kidney Disease: Improving Global Outcomes (KDIGO) stage 2 to 3 AKI and were not dialysis dependent at discharge. Approximately two-thirds of patients were men; the mean age was 66 years.

At the AKI follow-up clinic, patients received standardized assessment by a nephrologist, focused on blood pressure and proteinuria reduction, cardiovascular risk reduction, and management of chronic kidney disease (CKD) complications. Patients also received a sick-day medication list and quarterly laboratory tests for 1 year. Each patient attending the follow-up clinic was propensity score matched to four patients receiving standard care. Outcomes of interest were kidney and cardiovascular events, death from any cause, and use of cardioprotective medications.

At a mean follow-up of 2.2 years, the rate of major adverse kidney events was similar between groups: 22.1 per 100 patient-years for patients attending the AKI follow-up clinic and 24.7 per 100 patient-years for those receiving standard care. All-cause mortality was lower in the follow-up clinic group: 7.5 versus 10.7 deaths per 100 patient-years; hazard ratio (HR), 0.71. There was no difference in risk of chronic dialysis or CKD.

Risk of major cardiovascular events was significantly lower among patients seen at the AKI follow-up clinic: 11.0 versus 14.5 events per 100 patient-years; HR, 0.77. Clinic attendance was associated with higher rates of nephrologist visits, creatinine tests, and proteinuria within the first year after AKI. Follow-up clinic patients were more likely to be prescribed important cardioprotective medications, including statins, beta-blockers, and sodium-glucose cotransporter-2 inhibitors, although not angiotensin-converting enzyme inhibitors or angiotensin receptor blockers.

Although survivors of AKI have increased kidney and cardiovascular risks, they often have limitations in follow-up care. The authors' experience provides preliminary evidence that nephrologist evaluation at an AKI follow-up clinic has benefits, including decreased mortality and cardiovascular events.

The cohort study shows no reduction in adverse kidney events, however. The researchers conclude, "These results justify further testing of protocolized follow-up after AKI in randomized controlled trials" [Silver SA, et al. Association of an acute kidney injury follow-up clinic with patient outcomes and care processes: A cohort study. *Am J Kidney Dis*, published online ahead of print November 30, 2022. doi: 10.1053/j.ajkd.2022.10.011; https://www.ajkd.org/article/S0272-6386(22)01052-6/fulltext]. ■

No Difference in Cardiovascular Events with Cooler Dialysate

The use of personalized cooler dialysate—36°C or lower—does not reduce the risk of cardiovascular events among maintenance hemodialysis patients, concludes a randomized trial in *The Lancet*.

The pragmatic, open-label Major Outcomes with Personalized Dialysate TEMPerature (MyTEMP) trial was carried out at 84 hemodialysis centers in Ontario, Canada. With covariate-constrained randomization, centers were assigned to use a personalized cooler dialysate—0.5°C–0.9°C lower than the patient's body temperature; lowest recommended temperature, 35.5°C—or a standard dialysate temperature of 36.5°C.

The two groups were compared on a primary composite outcome of cardiovascular-related death or hospitalization for myocardial infarction, ischemic stroke, or congestive heart failure. Primary outcomes were recorded in Ontario databases by medical coders who were unaware of the study.

Over the 4-year study, the centers provided approximately 4.3 million hemodialysis treatments to 15,413 patients. Median follow-up was 1.8 years. Mean dialysate temperature was 35.8°C in the intervention group and 36.4°C in the standard treatment group.

Rates of the primary composite outcome were similar between groups:

21.4% with cooler dialysate and 22.4% with standard-temperature dialysate. Sensitivity and subgroup analyses yielded similar findings. Mean drops in intradialytic systolic blood pressure were 26.6 mm Hg and 27.1 mm Hg, respectively. Other secondary outcomes were comparable as well. Patients assigned to cooler dialysate were more likely to say they felt uncomfortably cold: relative risk, 1.6.

A growing number of dialysis centers have been using cooler dialysate, reflecting the belief that it may lead to improved cardiovascular outcomes. Although some studies have reported lower rates of cardiovascular mortality with cooler dialysate, the overall quality of evidence on this topic is considered low.

The MyTEMP trial shows no difference in cardiovascular mortality or major adverse cardiovascular events at maintenance hemodialysis centers using personalized cooler dialysate compared with standard-temperature dialysate. The study also finds no meaningful difference in mean drop in intradialytic systolic blood pressure or in intradialytic hypotension. The researchers conclude: "A lack of benefit compounded by the likelihood of patient discomfort provides no justification for use of cooler dialysate for all patients as a centre-wide policy" [MyTEMP Writing Committee; Garg AX, et al. Personalised cooler dialysate for patients receiving maintenance haemodialysis (MyTEMP): A pragmatic, cluster-randomised trial. *Lancet* 2022; 400:1693–1703. doi: 10.1016/S0140-6736(22)01805-0].

Nefecon Preserves Kidney Function in Primary IgAN

The new delayed-release budesonide formulation Nefecon slows the rate of decline in the estimated glomerular filtration rate (eGFR) in patients with primary immunoglobulin A nephropathy (IgAN), reports a placebo-controlled trial in *Kidney International*.

Nefecon is a targeted formulation designed to deliver the oral glucocorticoid budesonide locally in the ileum, with limited systemic exposure. In the previous phase 2b NEFIGAN trial, Nefecon treatment was associated with greater reduction in the urine protein-to-creatinine ratio (UPCR) and a smaller decline in the eGFR in patients with IgAN at risk of kidney failure.

The phase 3 Efficacy and Safety of Nefecon in Patients with Primary IgA Nephropathy (NefIgArd) study was designed to verify those results. The first phase of the multicenter trial enrolled 199 patients with primary IgAN, persistent proteinuria, and an eGFR between 35 and 90 mL/min/1.73 m^2. All had received optimized supportive care, including at least 3 months of stable renin-angiotensin system blockade.

Patients were randomly assigned to receive 9 months of treatment with Nefecon (16 mg/day) or placebo, followed by a 3-month observation period. The primary outcome was 24-hour UPCR at the end of treatment. Secondary outcomes included eGFR at 9 and 12 months and UPCR at 12 months.

At 9 months, UPCR had decreased by 31% from baseline in patients receiving Nefecon compared with 5% in the placebo group. Results were consistent in subgroup analyses. Patients in the Nefecon group had continued improvement after treatment's end, including a 48% reduction in UPCR at 12 months. Nefecon was also associated with a slower decline in eGFR: a 3.87 mL/min/1.73 m^2 difference compared with placebo. Treatment was well tolerated, with mild to moderate, reversible adverse events.

The first phase of NefIgArd "supports Nefecon as the first disease-modifying therapy approved for patients with primary IgAN at risk of kidney failure," the researchers write. An observational follow-up phase is underway to verify the long-term impact on kidney function [Barratt J, et al. Results from part A of the multi-center, double-blind, randomized, placebo-controlled NefIgArd trial, which evaluated targeted-release formulation of budesonide for the treatment of primary immunoglobulin A nephropathy. *Kidney Int*, published online ahead of print October 19, 2022. doi: 10.1016/j.kint.2022.09.017; https://www.kidney-international.org/article/S0085-2538(22)00836-5/fulltext].

Lower Use of Cardioprotective Drugs in Patients with MI with Previous AKI

Among patients with a history of myocardial infarction (MI), those who have survived an episode of acute kidney injury (AKI) are less likely to receive important classes of cardioprotective medications, according to a study in *Kidney International Reports*.

Using Ontario, Canada, administrative databases from 2008 to 2017, the researchers identified 28,871 patients, aged 66 years or older, with a history of MI who survived a hospitalization complicated by AKI. Of these, 21,452 were propensity score matched to patients without AKI. In the matched cohorts, the mean age was 80 years, and 40% of patients were women. MI occurred during the index hospitalization in 34% of patients.

The groups with and without AKI were compared in terms of time-to-outpatient dispensing of three classes of cardioprotective drugs—angiotensin-converting enzyme inhibitors/angiotensin receptor blockers (ACEIs/ARBs), statins, or beta-blockers—during the year after discharge. For all three drug classes, dispensing frequency was significantly lower among survivors of AKI: subdistribution hazard ratio (sHR), 0.93. The association was stronger among patients with Kidney Disease: Improving Global Outcomes (KDIGO) stage 2 or 3 AKI: sHR, 0.81 or 0.71, respectively.

On analysis of specific drug classes, statin dispensing was less likely for patients with stage 2 and stage 3 AKI, and dispensing of beta-blockers was less frequent in patients with stage 3 AKI: sHR, 0.86. Other medications were also associated with AKI status. For example, survivors of AKI were less likely to receive P2Y12 inhibitors and direct anticoagulants but more likely to receive warfarin.

Differences in the use of cardioprotective drugs may contribute to the increased risk of death among patients with a history of MI who survive an episode of AKI. This population-based cohort study finds less frequent dispensing of ACEIs/ARBs, statins, and beta-blockers among survivors of AKI with a history of MI.

"These results highlight a pivotal opportunity to improve care after hospitalization with AKI, they conclude" [Meraz-Muñoz AY, et al. Cardiovascular drug use after acute kidney injury among hospitalized patients with a history of myocardial infarction. *Kidney Int Rep,* published online ahead of print November 2, 2022. https://doi.org/10.1016/j.ekir.2022.10.027].

Copy-number Variants and Genomic Disorders, Going Beyond Monogenic Explanations of Kidney Diseases

By Michael Bernaba and Mira T. Keddis

The field of nephrology has bloomed amid a genomic revolution that has allowed genomics integration into the clinical practice to be feasible and affordable. Genomic testing has explained monogenic causes of kidney diseases in up to 25% of patients with kidney failure (1–3), and there is a growing body of evidence supporting the value of genetic testing for patients with unexplained kidney diseases or suspected monogenic processes in the nephrology practice (4, 5). Monogenic causes of kidney diseases are typically the result of discreet coding-region, single-base substitutions in the DNA or small insertions or deletions resulting in aberrant transcription and translation of functional protein products. A classic example of this is Fabry disease (6). However, it has long been recognized that much of the genetic differences among individuals are the result of larger alterations of the genome. This has been termed copy-number variants, in which greater than 50 base pairs of DNA are either deleted or duplicated. Oftentimes, the deletion or duplication can be as much as a kilobase or megabase in size. When a copy-number variant actually spans a pathology gene, it is termed a genomic disorder (as opposed to a monogenic disorder).

Verbitsky and colleagues (7), in a recent *JASN* article, extend our understanding beyond monogenic explanations of kidney diseases by examining the prevalence of copy-number variants and genomic disorders in patients with chronic kidney disease (CKD) across the lifespan. In this study, they report on 667 pediatric patients with CKD (419 from CKiD study and 248 from CKiD cohort II) and a combined adult cohort of 6679 patients from three multiethnic US studies, including the Chronic Renal Insufficiency Cohort (CRIC), Family Investigation of Nephropathy and Diabetes (FIND), and Columbia University CKD Biobank cohort (CU-CKD). They define copy-number variants as genomic disorders that have at least 70% overlap of their span with a set of known pathogenic copy-number variant coordinates obtained from the Database of Genomic Variation and Phenotype in Humans using the Ensembl Resources and the literature and in agreement with the American College of Medical Genetics and Genomics guidelines.

The authors showed that in the pediatric cohort, the overall prevalence of genomic disorders was 4.2% (a total of 28 participants out of 667). The prevalence was 4.5% (19 out of 419) in CKiD cohort and 3.6% (9 out of 248) in CKiD cohort II. For these participants, identification of genomic disorders helped to confirm, reclassify, or provide a more precise molecular explanation for an identified disease. Examples include deletions in chr17q12 (renal cysts and diabetes syndrome [RCAD]) and homozygous deletions in chr2q13 (*NPHP1*) and chr17p13.13 (*CTNS*). In adults, the prevalence of genomic disorders was lower, at 1.1% (72 participants out of 6679), but was present in a wide age span such that the highest prevalence was between the ages of 10 and 20 years (4.8%), and the oldest patient with a genomic disorder identified was 78 years of age. The most frequent copy-number variant that explained the genomic disorder in adult cohorts was a 17q12 deletion or duplication that was detected in 16 out of the 6679 (0.2%) patients in the adult cohort and at a ratio of 1:252 in those with CKD and diabetes, two conditions very commonly present in clinical practice but perhaps with less awareness of a potential genomic explanation.

RCAD is an autosomal-dominant, multisystem disorder caused by mutations on chromosome 17q12 (omim.org/entry/137920). This disorder is characterized by non-diabetic kidney diseases, hypomagnesemia, and early-onset diabetes, consistent with maturity-onset diabetes of the young. The findings of this study encourage the nephrology community to be aware of RCAD and consider this diagnosis in patients with diabetes and kidney disease. Other clinical clues identified in the adult cohort with genomic disorders included lower neurocognitive ability as measured by the Mini–Mental State Examination and educational level and increased mortality compared with non-genomic disorder carriers.

The findings of this study also highlight a few key takeaways: Genomic disorders are rare but when identified, can support diagnosis and evaluation and can provide an explanation for other organ dysfunctions, particularly neurocognitive changes; RCAD is present in 1:252 adult patients with CKD and diabetes; and genomic disorders are another piece of the puzzle in understanding CKD and associated co-morbidities. The addition of copy-number variant analysis in patients with CKD who are strongly suspected to have a genetic disorder could become a possibility after no single-nucleotide variants are found using traditional genetic testing.

> **Genomic disorders are rare but when identified, can support diagnosis and evaluation and can provide an explanation for other organ dysfunctions, particularly neurocognitive changes.**

Michael Bernaba, MD, is a second-year nephrology fellow at the Mayo Clinic, Phoenix, AZ. Mira T. Keddis, MD, is an associate professor of medicine with the Division of Nephrology and Hypertension, Mayo Clinic, and director of education for the Center for Individualized Medicine, Mayo Clinic, Scottsdale, AZ.

The authors report no conflicts of interest.

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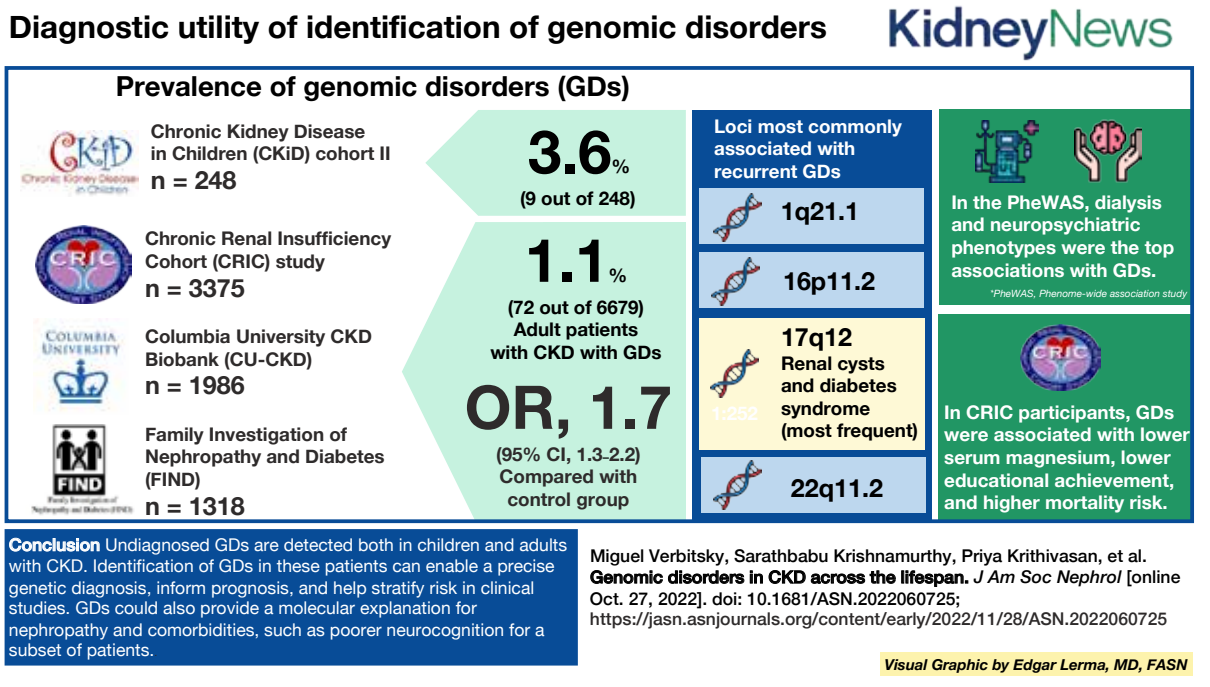


Nephrologist Ownership of Dialysis Facilities through Joint Ventures

By Varsha Danda, Said A. Ibrahim, and Sri Lekha Tummalapalli

Ownership structures in health care are rapidly evolving. Physician practices, which were historically physician owned, are now mostly owned by hospitals or other corporate entities, such as private equity firms or health insurers (1). Hospitals are infrequently owned by physicians and are required to disclose ownership relationships to patients. Physician ownership of dialysis facilities through joint ventures has raised concerns about financial conflicts of interest and has thus far been unstudied because these relationships are not made publicly available. Eugene Lin, MD, and colleagues (2) recently provided the first evidence of how nephrologist ownership of dialysis facilities may affect quality of care and patient outcomes.

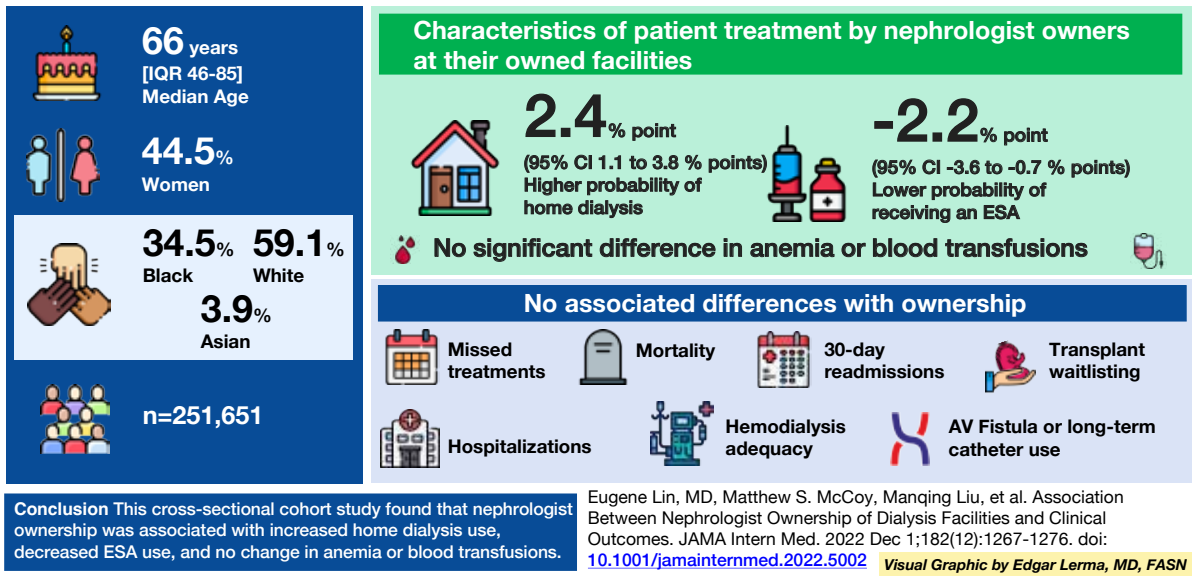
Lin and colleagues (2) obtained a list of dialysis facility owners registered in the Centers for Medicare & Medicaid Services' (CMS') Provider Enrollment, Chain, and Ownership System via a Freedom of Information Act request. Among the 6284 dialysis facilities analyzed, 15% had a nephrologist owner. The authors used a difference-in-differences approach to compare clinical outcomes among patients in joint-venture facilities treated by a nephrologist owner with patients treated by a nephrologist non-owner. Their quasi-experimental approach accounted for differences in patient clinical outcomes between nephrologist owners and non-owners in non-joint-venture facilities.

The study found that nephrologist ownership was significantly associated with a 2.4% (95% CI, 1.1%–3.8%) absolute increase in home dialysis use and a 2.2% decrease in erythropoietin-stimulating agent (ESA) use (95% CI, –3.6% to –0.7%). Increasing home dialysis and reducing ESA use could both increase dialysis facility profitability, but further research is needed to understand whether financial motives or other reasons were driving these differences. Nephrologist ownership was not associated with significant changes in missed treatments, transplant waitlisting, transfusions, hospitalizations, readmissions, dialysis adequacy, vascular access, or mortality. Although these findings are reassuring, they also suggest that potential benefits of nephrologist ownership are not yet being realized. For example, a nephrologist owner would be incentivized to invest in care coordination to reduce hospitalizations/readmissions and thereby missed treatments.

Lin and colleagues (2) provide a superb contribution to the literature through their use of novel data and rigorous statistical methods. Other questions of interest include whether nephrologist owners start patients on dialysis at higher estimated glomerular filtration rates or refer more patients to their joint-venture facilities—particularly higher-revenue patients (e.g., those commercially insured) or lower-cost patients (e.g., those not on expensive therapies within the End Stage Renal Disease Prospective Payment System [ESRD PPS] bundled payment). CMS recently released updates to Medicare Care Compare to provide information about nephrologist affiliations with dialysis facilities, which is an important step forward in data transparency (3). Similarly, we advocate for nephrology organizations and CMS to make joint-venture relationships more readily available for surveillance and research. ■

Varsha Danda, BA candidate, is with Washington University in St. Louis, MO. Said A. Ibrahim, MD, MPH, MBA, is with the Donald and Barbara Zucker School of Medicine at Hofstra/Northwell, Hempstead, NY. Sri Lekha Tummalapalli, MD, MBA, MAS, is with the Department of Population Health Sciences, Weill Cornell Medicine, New York, NY.

Ms. Danda and Dr. Ibrahim report no conflicts of interest. Dr. Tummalapalli reports research funding from Scanwell Health.



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Risk of Glomerular Disease Relapse after COVID-19 Vaccines—Correlation or Causation?

By Nasim Wiegley

Immune-related adverse reactions, including various forms of glomerular diseases, have been associated with vaccines throughout our history, including influenza and hepatitis B (1–4). Not surprisingly, with more than 13 billion doses of vaccines for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) administered worldwide since the inception of the coronavirus disease 19 (COVID-19) pandemic to date, several reported cases and case series of vaccine-associated, immune-related glomerular diseases, as either de novo or relapse of a prior disease, have been reported.

Minimal change disease (MCD) and immunoglobulin A nephropathy (IgAN) have been the most reported cases of COVID-19 vaccine-associated glomerular diseases, with varying presentation phenotypes. MCD tends to appear within a median of 7 days after the first dose of the SARS-CoV-2 vaccine and IgAN within 1–2 days of the second or third dose of the vaccine exposure (5). Other glomerular diseases, such as membranous nephropathy (MN), anti-neutrophil cytoplasmic antibody (ANCA)-associated vasculitis, and anti-glomerular basement membrane disease, have also been seen within a few weeks of the vaccine administration (6–12). Although this association is not indicative of causation, the volume of these reported glomerular cases and temporal correlation with the mRNA vaccine dose are intriguing and raise a unique challenge during patient counseling.

The majority of these reported cases happened in association with mRNA vaccine administrations (BNT162b2 [Pfizer-BioNTech] and mRNA-1273 [Moderna]) compared with other formulations, such as adenovirus vector vaccines. This could be due to the more widespread use of mRNA vaccines worldwide (5). However, mRNA vaccine technology is also known to produce a more potent immune response than adenovirus vector COVID-19 vaccines (13).

Caza et al. (14) noted 29 cases of potential vaccine-associated glomerular diseases, which manifested within 1 month of SARS-CoV-2 vaccination, in their cohort

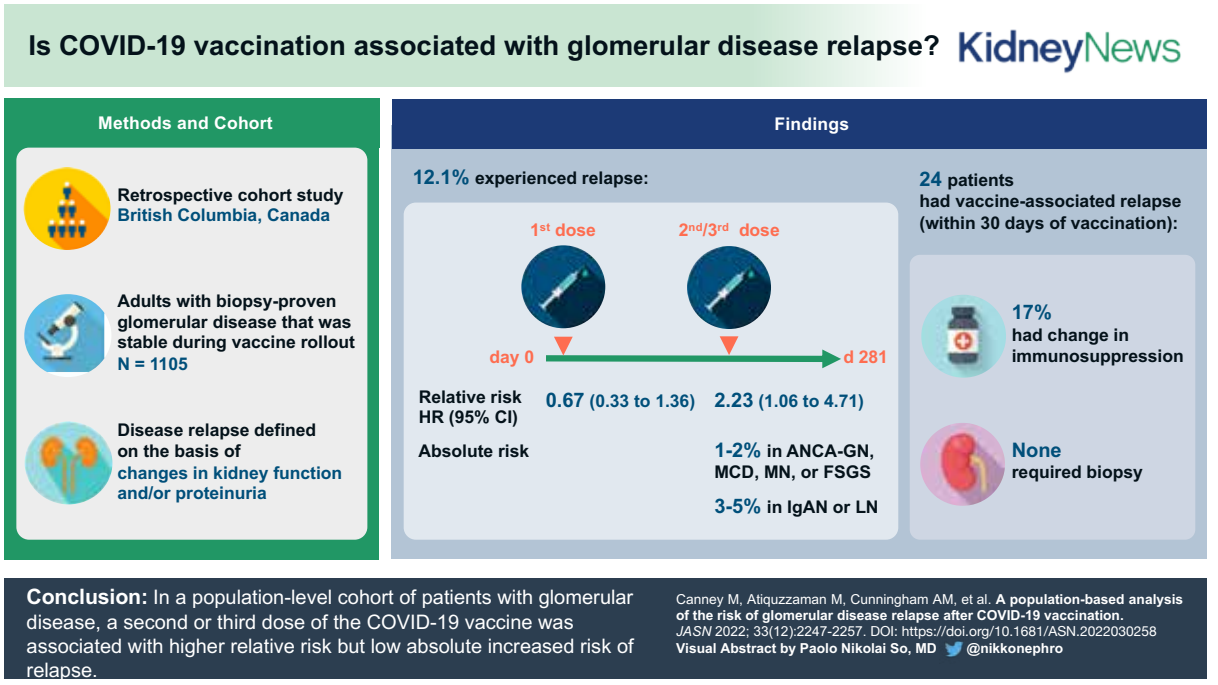
of for-cause kidney biopsies obtained at a single center. Notably, in comparison with the 2 years before the COVID-19 pandemic (2018–2019), there was no increase in the incidence of immune-related kidney diseases in their practice (14). Data from large-scale, population-based studies or controlled trials have been lacking to date.

A recent study by Canney et al. (15), published in *JASN*, aimed to investigate the relative and absolute risk of glomerular disease relapse after COVID-19 vaccination in a retrospective, population-based, cohort study. A centralized clinical and pathological registry of patients with biopsy-proven glomerular disease in British Columbia, Canada, was used. The primary outcome was a relapse of kidney diseases, defined as an increase in serum creatinine, worsening proteinuria, or both. During the follow-up period of 281 days, 134 of 1105 patients (12.1%) developed a disease relapse, 24 of which were considered to be vaccine-associated relapses (occurring within 30 days after vaccine administration). Overall, the first vaccine dose was not associated with increased relapse risk (hazard ratio [HR], 0.67; 95% confidence interval [CI], 0.33–1.36); however, repetitive exposure to the second or third dose of the COVID-19 vaccine was associated with a twofold increased risk of relapse (HR, 2.23; 95% CI, 1.06–4.71). A similar pattern was seen across various glomerular diseases. The increase in absolute risk of vaccine-associated relapse after a second or third dose was 3%–5% in those with IgAN or lupus nephritis (LN) and lower (1%–2%) in patients with other glomerular diseases, such as ANCA-associated glomerulonephritis (GN) vasculitis, MCD, MN, or focal segmental glomerulosclerosis (FSGS). Notably, only 4 of the 24 patients (17%) with vaccine-associated glomerular disease relapse required a change in immunosuppression therapy; the rest were self-limited, and none of these patients underwent a kidney biopsy. This suggests that most of these potential relapses appeared to be mild and self-resolving, although the long-term consequences remain unknown.

One limitation of the study by Canney et al. (15) is the absence of information on hematuria after vaccination, which might indicate that some cases of glomerular disease relapse were missed. There are reports of gross hematuria within days of exposure to COVID-19 vaccines (16, 17). These are usually self-limiting and do not require alteration of therapy; however, the impact on future kidney function remains unknown.

Patients with immune-mediated kidney diseases are at higher risk of severe COVID-19 infection compared with the general population (18). Thus, given the overall low absolute risk of these mild and self-limiting relapses, the benefits of vaccination in reducing the risk of severe COVID-19 infection outweigh the risks of glomerular disease flare. Nevertheless, clinicians should be aware of this potential relapse risk and monitor patients closely during the post-vaccination timeframe. Future research is needed to investigate the long-term effect of immune-mediated kidney disease relapse, especially in the setting of repetitive exposure to booster doses of SARS-CoV-2 vaccines, which raises uncertainty about whether the cumulative risk of repetitively stimulating the immune system would eventually prove clinically significant. ■

Nasim Wiegley, MD, FASN, is assistant professor of medicine with the Division of Nephrology, University of California Davis School of Medicine, Sacramento.



The author reports no conflicts of interest.

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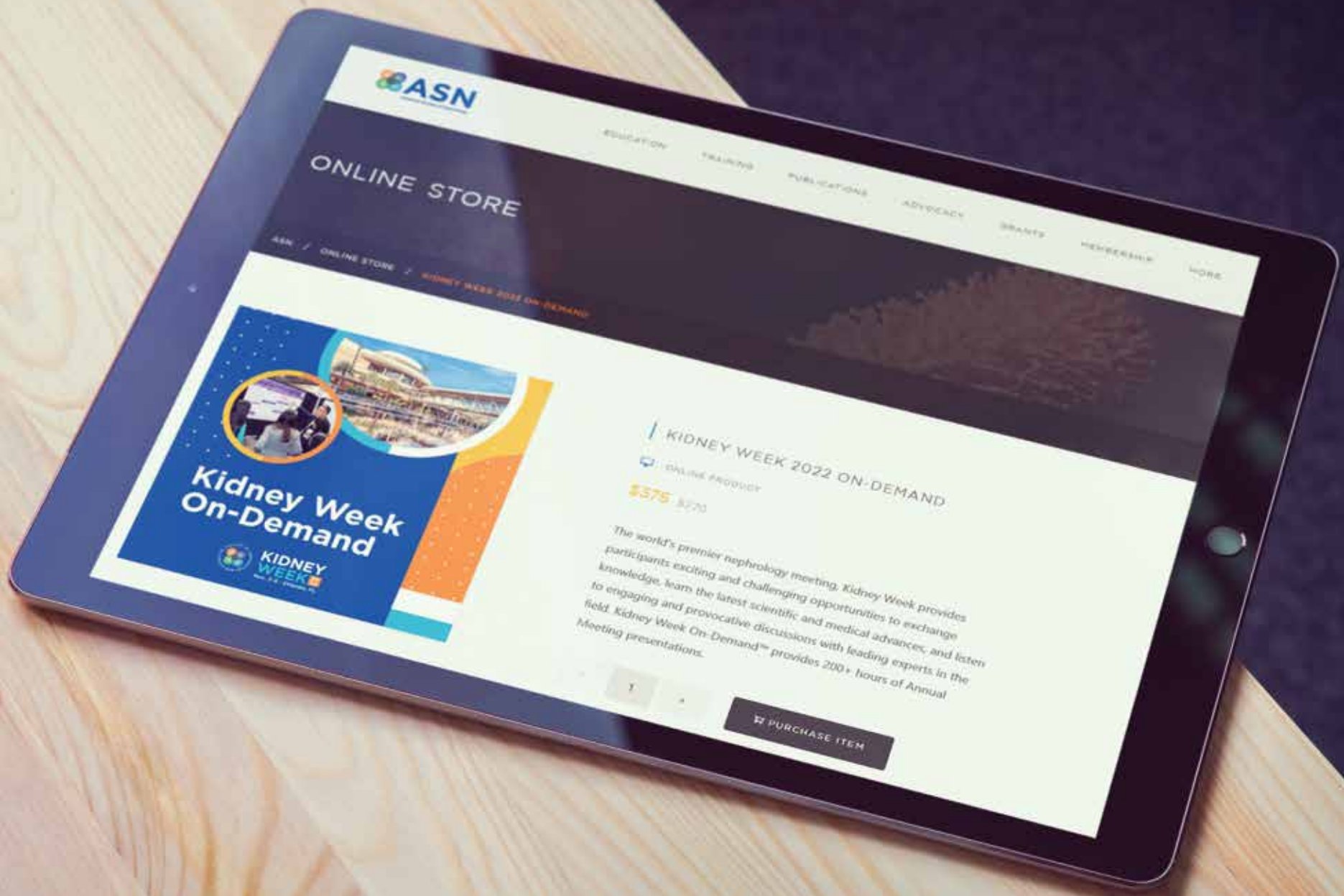

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