

## A Path to Training in Onconephrology

By Omar Mamlouk, Marco Bonilla, and Shveta Motwani

Over the past few decades, there has been rapid advancement in the care of cancer patients with a steady flow of novel therapeutics introduced into clinical practice. Accompanying the new therapies are myriad unintended treatment-related effects, some of which have involved the kidneys, electrolytes, acid-base balance, and blood pressure control. There has also been a shift in the mindset of the treating physicians (oncologists and nephrologists) to attempt a pathophysiological understanding and nuanced management of such treatment-related effects rather than binary labeling of drugs into “nephrotoxic” and “non-nephrotoxic” and discontinuation of therapy thought to be nephrotoxic. This evolution in thinking has led to the formation of multidisciplinary teams with nephrologists—onconephrologists—viewed as integral members of the team. Thus, the field implores nephrologists to dig deep and apply principles of renal physiology and pathology to this medically complex patient population.

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A career in onconephrology allows ample advantages. Primary drivers for most nephrologists entering this subspecialty are the high complexity and acuity, the cross-disciplinary collaboration in caring for a vulnerable patient population, and the fertile ground for research. Critical to training in onconephrology is the steady-flow referrals of patients with cancer being treated with a wide range of therapies so that the trainee can gain experience in identifying and managing kidney complications of such treatment. In addition, the necessary learning includes collaborating with oncologists to develop a pathophysiological rationale and approaches to treatment that may have limited backing in the form of traditional published evidence (e.g., monoclonal gammopathy of renal significance often requires significant advocacy on the part of the nephrologist for treatment with chemotherapy that is generally administered by oncologists). To streamline such learning, nephrology trainees or nephrologists

who desire to gain expertise in this field need to train with qualified experts. Thus, training in onconephrology is often more efficient at, but not limited to, large academic programs with attached cancer centers. Not all nephrology training programs have experts in onconephrology who can mentor trainees. However, this presents job opportunities for graduating onconephrologists to start their careers as the inaugural onconephrologists at such centers.

Becoming an onconephrologist entails either pursuing an onconephrology track within the 2-year nephrology fellowship or completing an additional year of onconephrology clinical or research fellowship (Table 1). The onconephrology track allows the nephrologist to home in on a niche and practice as an expert soon after graduation. Although completion as part of the 2-year fellowship is reasonable, pursuing an additional, dedicated 1-year fellowship offers the trainee time and patient volume to develop experience and gain in-depth learning in the specialty. It also allows for protected time and/or resources to participate in scholarly activities. Some programs may also include formal clinical research training as part of the curriculum. In addition to core training, elective rotations during the fellowship allow fellows to acquire specific exposure to patients with common subtypes of kidney-related complications who are referred to an onconephrology clinic. These rotations can be tailored based on fellow interest and include rotations, for example, through inpatient and outpatient stem-cell transplant to learn about transplant-related adverse effects on the kidney, through melanoma to learn about immunotherapy nephrotoxicity,

and through multiple myeloma to learn about myeloma and paraproteinemia-related renal manifestations. Furthermore, completion of a fellowship in onconephrology will help build the fellow’s resume and help him or her become a more attractive candidate for job applications, especially in academia. It is important to note, however, that such a dedicated year of training is not a requirement to become an onconephrologist. Although there are clear advantages, there are also some disadvantages of the additional year of onconephrology to consider. First, there are only four onconephrology fellowship programs in North America. Thus, the trainee may need to relocate from his or her fellowship program. Second, as with other fellowships, the financial aspect needs to be considered (i.e., another year of fellow’s salary!). Third, the onconephrology fellowship is not accredited by the Accreditation Council for Graduate Medical Education. Fourth, compared with spending additional years in research fellowship, the 3 to

6 months of research time during the year of onconephrology fellowship allow for little opportunity to perform highly impactful work. The research projects in such a short time are generally limited to observational studies (mostly retrospective) or review articles. Last, even with the additional time spent gaining expertise and the need for lifelong learning to manage this medically complex population, the reimbursement for onconephrology patients is identical to that of general nephrology patients. With the exception of a couple of programs in the United States, the vast majority of jobs also require a variable amount of general nephrology care experience (clinic, inpatient service, and dialysis rounding) to generate a salary commensurate with non-onconephrology-specialized peers. Thus, the value of becoming a regional or an institutional expert and referral point person in onconephrology is largely non-financial.

Regardless of the path a trainee takes into onconephrology, it must be accomplished alongside experts in the field. This is especially important given the scarcity of established guidelines on the management of cancer-related kidney diseases that make up onconephrology, thereby stressing the importance of expert opinion. We hope that more trainees will gain interest in this rapidly growing and incredibly gratifying subspecialty within nephrology. ■

*Omar Mamlouk, MBBS, completed his nephrology fellowship at The University of Texas McGovern Medical School. During the fellowship, he had the opportunity to rotate at MD Anderson Cancer Center and developed an interest in onconephrology. He decided to pursue a 1-year onconephrology fellowship at MD Anderson Cancer Center to expand his knowledge of kidney diseases associated with cancer and cancer therapies, with special interest in immunotherapy-associated kidney toxicity. After graduation, he joined the Section of Nephrology at The University of Texas MD Anderson Center in Houston as faculty.*

*Marco Bonilla, MD, currently is a second-year nephrology fellow at the Donald and Barbara Zucker School of Medicine at Hofstra/Northwell, Great Neck, NY, with an onconephrology and glomerular disease track. Since the beginning of his fellowship and under his mentor’s guidance, he has been part of a dedicated onconephrology clinic and developed many collaborative partnerships with experts at a national and international level, thus creating a niche and tailoring his future academic career in this field. He will be joining an academic center in July 2022 with a vision to embark on onconephrology at that center.*

*Shveta Motwani, MD, MMSc, completed her nephrology fellowship at the Brigham and Women’s and Massachusetts General Hospitals combined program in nephrology. Her interest in onconephrology began in her second year of internal medicine residency, and she organized her fellowship rank order list keeping this intention front and center. Starting in her second year of fellowship, she entered the continuity clinic in onconephrology and began formal training in research with the master’s program in clinical and translational investigation at Harvard Medical School. After graduating from fellowship, she practiced as an onconephrologist at the Dana-Farber Cancer Institute and Brigham and Women’s Hospital for 6 years, which concluded in March 2022. As of April 2022, she became the Director of Onconephrology at Lahey Hospital & Medical Center, Burlington, MA, to create an onconephrology program at that hospital.*

The authors report no conflicts of interest.

**Table 1. Advantages and disadvantages of two onconephrology training tracks**

Onconephrology training	Pros	Cons
As a track/focus within a 2-year nephrology training program	<ul style="list-style-type: none"> <li>• Fewer overall years training</li> <li>• Financially advantageous to graduate fellowship</li> <li>• Earlier clinical career in the field upon graduation</li> </ul>	<ul style="list-style-type: none"> <li>• Limited involvement in prospective clinical trials</li> <li>• Limited research opportunities</li> </ul>
As a 1-year onconephrology fellowship after 2-year nephrology training	<ul style="list-style-type: none"> <li>• More relevant clinical experience</li> <li>• Adequate time to participate in scholar activities and receive clinical research training</li> <li>• Competitive resume</li> </ul>	<ul style="list-style-type: none"> <li>• Relocation given the limited number of fellowship programs</li> <li>• Non-accredited fellowship</li> <li>• Limited research time compared with research fellowship track</li> </ul>