

Pediatric to Adult Transition: Identifying Important Comorbidities and Considerations for Adult and Pediatric Nephrology Health Care Teams



The transition from pediatric and adolescence into adulthood represents a unique problem for many spectra of diseases, especially for kidney diseases. During this time, adolescents are expected to learn how to manage their own condition and to independently navigate the complexities of the health care system and their evolving health condition. Ongoing psychosocial development and potentially having to navigate new locales and experiences for further education or jobs can compound these issues. These transition periods can be defining moments for these individuals in determining optimal prognosis for their condition. Poor transitions can necessitate the need for dialysis or transplantation. There is a need for standardized transition protocols and efficient crosstalk between pediatric, adolescent, and adult providers to help patients navigate this process and ensure they have the tools needed to have agency over their condition.

Due to the paucity of standardized transition protocols, the variability in outcomes for pediatric patients moving into the adult realm can be dependent on the integration between their local pediatric and adult health care system. This issue of *Advances of Chronic Kidney Disease (ACKD)* explores the important characteristics of and features pediatric presentations of chronic kidney disease that should be on the radar of adult nephrologist. Additionally, we review major symptoms, causes, and comorbidities associated with chronic kidney disease which can be exacerbated through a poor transition process.

This issue opens with a review of the important signs and characteristics of Alport Syndrome by Kashtan (pp 225-230). This article highlights the main clinical features to be aware of in the management of congenital conditions and some unique identifiers that may be missed by adult nephrologists who don't commonly work with this population. Similarly, Licht (pp 231-242) presents a guide for adult nephrologists and hematologists when managing atypical hemolytic uremic syndrome (aHUS) and complement 3 glomerulopathy (C3G). There are many unique characteristics for these patients that can be overlooked.

On the theme of congenital conditions, Trachtman (pp 221-224) follows with an overview of the genetic spectrum for various nephrotic conditions and their prognosis and progressions into adulthood.

Flynn (pp 263-274) reviews the significance of hypertension within these populations and how management needs to be streamlined when transitioning through these health systems. Poorly managed hypertension can lead to worsening prognosis across age levels and requires prompt intervention that is maintained throughout the transition process. Bonilla (pp 243-250) similarly investigates the effects of premature growth on the progression of hypertension and its connection dysfunction of renal volume.

Butani (pp 308-317) looks into the urologic considerations of CKD within this population and how it may lead to unforeseen complications that go unnoticed or may be delayed in acknowledgment by adult providers. A common issue in both adult and pediatric CKD populations is that of mineral bone disease. Kusumi and Mahan (pp 275-282) discusses this in their article on promoting linear growth and bone health to avoid vascular calcification. Renally mediated bone dysfunctions can be seen in all manners of CKD across ages levels, and prompt intervention through diet and electrolyte balance can help to halt their progression.

Similarly, a problem seen in these populations is the improper delivery of nutrition, which can lead to stunted growth and electrolyte abnormalities. Topaloglu (pp 283-291) highlights potential prognosis in pediatric patients who are lacking in nutrition and their development through the transition period. Topaloglu and Filler (pp 292-307) then work together to address the challenge in transitioning of adolescents with hereditary tubular

disorders to adult service. This article provides important points and observations to keep in mind when these patients move to adult care. Just as important as the physiological considerations are the psychosocial ones. Pruette (pp 318-326) looks into the critical role of family support systems in helping adolescent patients adjust to new and unfamiliar settings.

With the rising prevalence of obesity and its considerable impact as a comorbidity, Nair and colleagues (pp 251-262) investigate important biomarkers that can be inductive of dysfunction within obese adolescents with CKD. This intersection can help highlight the need to manage this modifiable risk factor to improve outcomes.

For a quality transition process there are a few aims that need to be met. There needs to be strong teamwork and coordination between the pediatric and adults' health care teams that provide education outside of their medical condition alone. Education needs to be adaptable, respectful, and culturally appropriate with promotion of skills for communicating, assertiveness, decision making, and advocating for oneself. These lessons should enable patients to be independent enough to manage their treatment plan and give them the confidence to seek assistance from their provider team when they need help and allow them to maximize their lifelong quality of life and potential.

When discussing standardized testing, the important players need to be identified. First and foremost are the patient in question and their family. Both groups need to be educated on the process and ensure there is support every step of the way. On the other side are the professionals that make up the patient's health care team. This includes individuals such as the primary, secondary, and tertiary providers; education services; social services; and dietitians. All of these players need to be on the same page in order to deliver quality care to this potentially vulnerable population.

First is the pretransition stage, where patients 14 to 18 years old have the support and care of pediatric physicians and their family. Next is the active transition stage between ages 18 to 21 years, which requires the collaboration of both adult and pediatric teams in the transition process. Finally there is the post transition stage, which is complete by age 21 years with follow-ups until age 26 years. These transition stages must be individualized for each patient with full agreement from all the stakeholders. These transitions need to take place during times of stability and after the adolescents' school education has finished. Finally, the process needs to be mindful of other specialties that need to be involved, along with the financial considerations of their care. To combat the lack of standardized protocols, the RISE protocol was devised to assist with identifying the important aspects of the transition process.¹ These include *Recognizing* the patient's disease process and their role within the health care system. Second, it includes *Insight* into the potential progression

and actual progression of their disease and factors that can influence it. Third is *Self-reliance* in navigating the health care system and obtaining medications and getting appointments. Finally, there is the *Establishment* of healthy lifestyle choices and active adherence to one's treatment plan. Some tools that can assist in the above process are being able to manage the adolescent's ability to manage their condition and to actively involve them in the decision-making process from a young age. Support them in having agency over their health care decisions by encouraging them to ask questions about their condition and treatment plan. Finally, help them find resources with support groups and/or therapeutic camps so they interact with peers who are like them.

We thank the authors for all their help and contributions to this important transition-specific issue. The topics noted will have utility for pediatric and adult health care professionals alike, and it is hoped they serve as an impetus for increased standardization and improvement of the transition process.

ACKNOWLEDGMENTS

We thank Nikhil Nair (Department of Internal Medicine, Case Western Reserve University School of Medicine, Cleveland, OH) and Hui-Kim Yap, MD, MMed, MBBS (Department of Paediatrics, Yong Loo Lin School of Medicine, National University of Singapore, Singapore; Khoo Teck Puat - National University Children's Medical Institute, National University Hospital, Singapore) for their contributions.

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Financial Disclosure: The authors declare that they have no relevant financial interests.

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