

## Evolution of Pediatric Nephrology in Eastern North Carolina

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Pediatric patients with nephrologic disorders are a unique population with complex medical needs who often require specialized dietary, social, financial and educational support services. Many of these patients have underlying developmental or genetic disorders in addition to their kidney disease which warrant multidisciplinary care. In the past dysplastic and developmental disorders of the kidney and urogenital tract were the leading causes of kidney disease that progressed to end-stage renal disease (ESRD). Recently we have observed a change in the spectrum of pediatric renal disease from predominantly inherited or developmental disorders towards an increasing proportion of children referred for primary hypertension, renal hyperfiltration and metabolic syndrome. These children are at much higher risk of developing diabetes and progressive renal disease. According to NHANES the rates of incident ESRD related to diabetes in the 22-40 year-old age group are accelerating while stable or declining in all other age groups aside from patients 75 years or older. In 2010 the US Department of Health and Human Services put forth the Healthy People 2020 national health objectives of which one of 28 focus areas was “reducing new cases of CKD and its complications, disability, death, and economic costs.” Eastern North Carolina has a particularly high burden of diabetes, hypertension and obesity. This affects not only the adult population, but increasingly these disorders are being discovered in our adolescents and school age children. At present we do not know the true prevalence of pediatric kidney disease. Because of this it is difficult to accurately estimate how many of these individuals progress to advanced stages of chronic kidney disease (CKD) or to kidney failure. Pediatric Nephrology in eastern North Carolina has been a presence since 1983. Between 1983 and 2003 there was a sustained patient base of about 800 patients. Although in general pediatric-aged patients comprise only about 0.1% of persons requiring dialysis for end-stage renal disease, the number of young patients with chronic nephrologic disorders is likely much higher. These patients suffer high morbidity and mortality especially if there is a delay in disease detection. The pediatric nephrology community has made significant advances in the diagnosis and early detection of kidney disease over the past decade. Widespread use of prenatal ultrasound has allowed us to detect many more cases of obstructive, dysplastic and cystic kidney disorders even before patients are born. Advances in genetic testing and understanding of disease factors have allowed us to identify children at risk for problems leading to chronic kidney disease such as vesicoureteral reflux, glomerular disorders, renal tubular disorders and stone disease and have allowed us to refine our management of these patients. Development of new standardized equations for estimation of kidney function in children is now allowing us to better detect and monitor early kidney disease in a more uniform fashion. For a period between 2003 and 2008 the pediatric nephrology presence in eastern North Carolina was intermittent and many patients had to travel over 75 miles to access specialized care. Bringing back specialized nephrologic care and related services for our pediatric population has been a focus of the Pediatric Department at East Carolina University and Pitt County Memorial Hospital. In the past 5 months the program has expanded from one full time and one part time nephrologist to 3 full time and one part time nephrologist. Pitt County Memorial

Hospital and ECU is dedicated to providing high quality, accessible, integrated care to pediatric patients with kidney disease. In an effort to facilitate care the Pediatric Nephrology Division at ECU is reaching out to community pediatricians and developing collaborations with clinicians in general pediatrics, cardiology, endocrinology, and maternal-fetal medicine along with allied health services to provide the integrated yet specialized care that these patients require. In addition ECU is participating in multicenter research trials to advance understanding, prevention and management for pediatric patients with nephrologic disorders. Active patient recruitment is currently underway for patients with CKD, newly diagnosed nephrotic syndromes and atypical Hemolytic Uremic Syndrome or Thrombotic Thrombocytopenic Purpura. Collaborations with adult nephrologists are also in place to improve the transition of care for the adolescent patient into the adult medical setting. Dialysis services for children who develop acute or chronic kidney failure along with kidney transplantation is now available and being conducted at ECU.

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