



# Entrustable Professional Activities

## EPA 2 for Pediatric Nephrology

### EPA 2: Care of Children with Chronic Electrolyte and Kidney Disorders, Including Hypertension and Disorders of the Urinary Tract

#### Supervision Scale for This EPA

1. Trusted to observe only
2. Trusted to execute with direct supervision and coaching
3. Trusted to execute with indirect supervision for most simple and some complex cases
4. Trusted to execute with indirect supervision but may require discussion for a few complex cases
5. Trusted to execute without supervision

#### Description of the Activity

Pediatric nephrologists are specifically trained to care for children of all ages who have chronic electrolyte disorders, including abnormalities of sodium, potassium, calcium, phosphorus, water metabolism, acid-base and/or fluid balance, and kidney disorders, including hypertension and disorders of the urinary tract. The appropriate evaluation and management of children with chronic electrolyte and kidney disorders is the specific province of pediatric nephrologists. Pediatric nephrologists must be effective in the selection and provision of all chronic electrolyte and kidney therapies and provision of appropriate counseling and follow up of children with chronic electrolyte and kidney disorders.

The specific functions which define this EPA include:

1. Applying important clinical, epidemiologic, and environmental knowledge to the care of children with chronic electrolyte and kidney disorders
2. Directing appropriate evaluation methods
3. Initiating an effective treatment plan
4. Recognizing the impact of chronic electrolyte and kidney disease on the physical, mental, and emotional development of the child in the context of the child/family unit, and engaging allied health professionals to address adjustment issues
5. Providing effective care of such children through participation and/or direction of an effective interprofessional health care team
6. Constructing and communicating appropriate follow-up plans and providing follow-up care as necessary
7. Demonstrating caring, compassionate, empathetic, effective communication and principled professional behavior with patients, family, and the health care team in the care of such children

#### Judicious Mapping to Domains of Competence

- Patient Care
- Medical Knowledge
- Practice-Based Learning and Improvement
- Interpersonal and Communication Skills
- Professionalism
- Systems-Based Practice
- Personal and Professional Development



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### Competencies Within Each Domain Critical to Entrustment Decisions

PC 6:	Using optimal clinical judgment
PC 7:	Developing management plans
PC 9:	Counseling patients and families
MK 1:	Demonstrating knowledge
ICS 1:	Communicating with patients/families
SBP 1:	Working in care delivery settings and systems
SBP 2:	Coordinating care
SBP 5:	Working in interprofessional teams

### Context for the EPA

**Rationale:** Pediatric nephrologists must be able to anticipate and manage kidney disease and associated complications and comorbidities in a longitudinal fashion. This knowledge is applicable to the long-term outpatient care of pediatric nephrology patients and extends to inpatient care of a hospitalized patient with chronic conditions.

**Scope of Practice:** Pediatric nephrologists are trained to deal with both the acute and chronic management of kidney disorders and electrolyte disturbances. **Acute** management including the initial evaluation, diagnosis, and treatment is beyond the scope of this document (see Pediatric Nephrology EPA 1). This document addresses the scope of knowledge and skills of the pediatric nephrologist as they apply to the **long-term management** of pediatric patients with kidney disease and electrolyte imbalance.

### Curricular Components That Support the Functions of the EPA

1. Applying important clinical, epidemiologic, and environmental knowledge to the care of children with chronic electrolyte and kidney disorders. This includes abnormalities of water, sodium, potassium, calcium, phosphorous, magnesium, acid-base and fluid balance, chronic kidney disorders, urinary tract disorders and hypertension
  - Performs a thorough history and physical examination when necessary and a focused history and physical examination when necessary
  - Formulates a broad differential diagnosis appropriate for children with chronic electrolyte and kidney disorders
  - Uses expertise and knowledge of pediatric kidney disease and renal physiology to narrow the differential diagnosis appropriately

Diseases/disorders generally within the scope of pediatric nephrology practice where the role of the pediatric nephrologist is to evaluate and manage include, but are not limited to

- Congenital anomalies/abnormalities of the kidney and urinary tract [CAKUT]
  - Kidney (e.g., multicystic dysplastic kidney, renal dysplasia, renal agenesis, inherited cystic kidney diseases including Polycystic Kidney Diseases, nephronophthisis)



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- Urinary tract (e.g., obstructive uropathy, posterior urethral valves, ureteropelvic junction obstruction, ureterovesical junction obstruction)
- Nephrotic syndrome (e.g., minimal change disease, focal segmental glomerulosclerosis, membranous nephropathy)
- Primary glomerulonephritides (e.g., mesangial proliferative glomerulonephritis, C3 glomerulopathy, IgA nephropathy)
- Secondary glomerulonephritides (e.g., post-infectious glomerulonephritis, IgA nephropathy, mesangioproliferative glomerulonephritis, membranoproliferative glomerulonephritis)
- Glomerulonephritis associated with systemic disease (e.g., Henoch Schonlein purpura, systemic lupus erythematosus, vasculitis, Goodpasture syndrome, diabetes)
- Hereditary glomerular diseases (e.g., Alport syndrome, Fabry disease, Nail-Patella syndrome)
- Thrombotic microangiopathies (e.g., Shiga toxin associated Hemolytic Uremic Syndrome (HUS), complement disorder associated HUS, post-Bone Marrow Transplant associated Thrombotic Microangiopathy, Thrombotic Thrombocytopenic Purpura)
- Essential hypertension
- Secondary hypertension (including renovascular causes)
- Nephrolithiasis and nephrocalcinosis
- Disorders of renal tubular function (e.g., Dent disease, glucosuria, nephrogenic diabetes insipidus)
- Syndrome of Inappropriate Anti-Diuretic Hormone
- Renal tubular acidosis
- Fanconi syndrome and causes (e.g., cystinosis)
- Pseudohypoaldosteronism type 1
- Bartter and Gitelman syndrome
- Disorders of vitamin D metabolism

Aspects of disease management generally within the scope of pediatric nephrology practice include:

- Initiation, monitoring and adjustment of medications for treatment
- Appropriate follow-up recommendations for monitoring disease progress
- Recognition of expected complications of disease and therapy
- Recognition and appropriate management of comorbidities seen with chronic kidney disease (e.g., anemia, metabolic bone disease, short stature, hypertension)
- Appropriate referral of patients approaching end stage renal disease (see Pediatric Nephrology EPA 3)

Problems/situations that **generally** require consultation where the role of the pediatric nephrologist is to recognize, provide preliminary evaluation and refer:

- Conditions that require co-management with pediatric urology (e.g., vesicoureteral reflux, nephrolithiasis, obstructive uropathy, patients requiring catheterization)
- Conditions that require co-management with pediatric rheumatology (e.g., systemic lupus erythematosus, pauci-immune vasculitis)
- Conditions that require co-management with genetics and/or metabolism (e.g., cystinosis, Fabry disease)
- Conditions that require co-management with cardiology (e.g., hypertension, congestive cardiac failure, pericardial effusion, aortic root dilation, vascular health)



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- Conditions that require co-management with endocrinology (e.g., short stature, hypothyroidism)
  - Conditions that require co-management with hematology /oncology: (e.g., chemotherapeutic medication nephrotoxicity, SIADH)
  - Conditions that require co-management with surgery (e.g., suboptimal weight gain or fluid intake necessitating G-tube placement)
  - Conditions that require co-management with reproductive endocrinology/gynecology (e.g., patients requiring medications that affect fertility)
  - Conditions where co-management with either developmental-behavioral specialists and/or child psychiatrists is essential to address comorbid conditions
2. Directing appropriate evaluation methods
- Recommends or directly orders the appropriate laboratory tests to assist in diagnosis and treatment selection
  - Identifies available kidney imaging modalities and recommends or orders the appropriate studies balancing risks (e.g., radiation) and benefits for the patient. These may include:
    - Ultrasound
    - Standard radiography and fluoroscopy (e.g., voiding cystourethrogram, CT, MRI)
    - Nuclear medicine studies
    - Vascular imaging (Duplex ultrasound, CT or MR angiography, arteriogram)
3. Initiating an effective treatment plan
- Recommends or directly arranges for both nonmedical and medical treatment.
  - Demonstrates familiarity with the indications for, dosing and monitoring of the following categories of medical treatment:
    - Electrolyte and fluid replacement/treatments, including diuretics
    - Immunosuppressive and immunomodulatory agents
    - Antihypertensive medications
    - Other agents required in kidney disorders (e.g., phosphate binders, vitamin D analogues, erythropoiesis stimulating agents)
  - Incorporates proper recognition of prognostic and long term follow up/chronic issues for children with chronic electrolyte and kidney disorders
4. Recognizing the impact of chronic electrolyte and kidney disease on the physical, mental, and emotional development of the child in the context of the child/family unit and engaging allied health professionals to address adjustment issues
- Explores and identifies effects and impact of chronic kidney conditions on the physical, mental, and emotional development of the child
  - Addresses the context of the family, community, and society in influencing and promoting the health and psychosocial outcomes of the child with CKD
  - Functions as part of a multidisciplinary team to promote the best psychosocial outcomes for these children
  - Knows that the essence of providing chronic care involves care delivery that is multidisciplinary, comprehensive, coordinated, accessible and patient-centered, meeting the medical, social, developmental, behavioral, mental health, educational, and financial needs of the patient and family



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5. Providing effective care of such children through participation and/or direction of an effective interprofessional health care team
  - Functions as part of a multidisciplinary team to manage pediatric patients with kidney disease (nurse, dietician, social worker, psychologist, play therapist, music therapist)
  - Identifies conditions which require co-management with other pediatric subspecialists
6. Constructing and communicating appropriate follow-up plans and providing follow-up care as necessary
  - Formulates initial plan for evidence-based care and engages patient/family as well as other key team members in shared decision making
  - Communicates final plan effectively to patients, their families (taking health literacy and family values into account) and other members of the health care team
7. Demonstrating caring, compassionate, empathetic, effective communication and principled professional behavior with patients, families, and the health care team in care of such children
  - Clearly states plans of care and documents appropriately for patients, families, and other members of the health care team
  - Encourages and responds effectively to questions about diagnosis, workup, and plan
  - Maintains and displays compassion toward patients and families
  - Interacts professionally with patients, families, and other members of the health care team at all times, in an atmosphere of mutual respect and collaboration
  - Provides empathetic care to patients and families
  - Maintains the highest levels of professionalism in interactions with patients, families, and members of the health care team

## References

1. The American Board of Pediatrics. Training Requirements for Subspecialty Certification. 2004. Available at <https://www.abp.org/sites/abp/files/trainingrequirements.pdf>.
2. Federation of Pediatric Organizations Policy Statement. Pediatric Fellowship Training. *Pediatrics* 2004;114:295-296.

## EPA Authors

John Mahan, MD (lead), Alicia Neu, MD, Paul Grimm, MD, Rebecca Lombel, MD, Kevin Meyers, MD, Barry Warshaw, MD

## Curricular Components Authors

John Mahan, MD (lead), Beatrice Goilav, MD, Paul Grimm, MD, Susan Halbach, MD, Rebecca Lombel, MD, Kevin Meyers, MD, Jordan Symons, MD, Shamir Tuchman, MD, Barry Warshaw, MD