

Pediatric Nephrology Content Outline

In-Training, Certification, and
Maintenance of Certification Exams

*Effective for examinations administered
April 1, 2018 and after*

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Overview

This content outline was developed primarily to serve as the blueprint for the pediatric nephrology in-training, initial certification, and maintenance of certification examinations. This outline identifies for all important stakeholders (eg, prospective candidates, diplomates, the public, training programs, professional associations) the knowledge areas being measured by these exams.

This outline takes effect on April 1, 2018. All pediatric nephrology examinations administered after this date will adhere to the specifications within this outline.

DEVELOPMENT OF THE PEDIATRIC NEPHROLOGY CONTENT OUTLINE

The initial draft of this content outline was developed by the ABP's Pediatric Nephrology Subboard, which is comprised of a diverse, representative panel of practicing pediatric nephrologists. The panel identified the knowledge required of pediatric nephrologists in clinical practice and categorized that knowledge into content domains and subdomains. All board certified pediatric nephrologists (N = 610) were then invited to provide feedback via an online survey. A total of 145 pediatric nephrologists (24%) rated the frequency and criticality of the content domains and subdomains. The survey also collected open-ended comments from respondents in order to identify any important content areas that were not included in the initial draft.

The survey results were used to make final revisions to the outline and to establish the exam weights (ie, the percentage of exam questions associated with each content domain). The content domains that were rated as highly critical and frequently required in practice have been weighted more heavily than the domains rated as less critical and/or less frequently required. Establishing the exam weights in this manner helps to ensure that ABP's pediatric nephrology exams are measuring the full breadth of knowledge required for clinical practice, while also placing an appropriate amount of emphasis on the content domains that were identified by practicing pediatric nephrologists as being critically important.

CONTENT DOMAINS

The knowledge for safe and effective practice as a pediatric nephrologist has been categorized into 12 content domains, presented in the table below. A more detailed breakdown of the knowledge within each domain is reflected in the detailed content outline, beginning on page 4. Each exam question included on a pediatric nephrology exam (in-training, initial certification, and maintenance of certification) is classified according to the content domain to which it is most closely aligned. If an exam question does not align with one of the content domains, it is removed from the question pool and is not included on an exam.

Pediatric Nephrology Content Domains	
1.	Fetal and Neonatal Nephrology
2.	Fluid, Electrolyte, and Acid-base Balance
3.	Core Diagnostics
4.	Glomerular Disorders
5.	Acute Kidney Injury (including acute dialysis)
6.	Cystic and Structural Disorders
7.	Micturition, Urinary Tract Infection, Urolithiasis, and Renal Masses
8.	Normal and Abnormal Blood Pressure
9.	Chronic Kidney Disease and End-stage Renal Disease
10.	Chronic Dialysis
11.	Renal Transplantation
12.	Core Knowledge in Scholarly Activities

UNIVERSAL TASKS

To help ensure the clinical relevance of the pediatric nephrology exams, the pediatric nephrology subboard identified a set of four universal tasks, described in the table below, that reflect the primary ways in which pediatric nephrology knowledge can be applied in clinical practice. Each exam question is classified according to the universal task to which it is most closely aligned. If an exam question does not align with one of the universal tasks, it is removed from the question pool and is not included on an exam.

Universal Tasks for Pediatric Nephrology	
Universal Task	Description
1. Core Science, Pathophysiology, and Pathogenesis	Understanding the core science and pathophysiologic basis of pediatric nephrology conditions in an age-specific developmental context
2. Epidemiology and Risk Assessment	Recognizing patterns of health and disease and understanding the variables that influence those patterns, including risk factors, natural history, and conditions that affect outcomes
3. Diagnosis and Testing	Using available information (eg, patient history, physical exam, laboratory tests, urinalysis, biopsy, imaging, and other tests) to formulate differential diagnoses and monitor disease progression, response to treatment, and complications
4. Management and Treatment	Formulating comprehensive management and/or treatment plans in inpatient and outpatient settings with multiple options for care

DEVELOPMENT AND CLASSIFICATION OF EXAM QUESTIONS

Although the field of pediatric nephrology is continually evolving, the content domains and subdomains within this outline should be viewed as broad categories of knowledge that are likely to remain relatively stable over time. The detailed knowledge within the content domains and subdomains, however, is likely to change as the field continues to advance. Because exam questions may assess a pediatric nephrologist's knowledge of a specific element within a content domain/subdomain, it is important to note that it is the responsibility of the test taker to ensure that his or her knowledge within each knowledge area is current and up to date.

In order to ensure all pediatric nephrology exam questions are current and up to date, the ABP follows a rigorous item development and approval process. Each exam question is written by a board-certified practitioner or academician who has received training on how to write high quality exam questions. Each question is classified according to the content domain/subdomain to which it is most closely aligned and according to the universal task to which it is most closely aligned. Questions that do not align with a content domain/subdomain and a universal task are not included in the question pool and are not included on an exam.

Once a question has been written, it is then discussed and revised, if necessary, by the pediatric nephrology subboard, a large, diverse panel of practicing pediatric nephrologists. During the revision process, each question is also reviewed multiple times by a medical editor to ensure accuracy and by staff editors who standardize question style, format, and terminology; correct grammar; and eliminate ambiguity and technical flaws, such as cues to the answer.

Once the subboard has approved a question, it is included in the question pool and is made available for future exams. All approved questions in the pool, including questions that have been used previously on an exam, are reviewed periodically for accuracy, currency and relevance.

SAMPLE QUESTION

To illustrate how exam questions are classified, consider the following sample question:

A 6-year-old boy has nephrotic syndrome. Severe abdominal pain develops while he is receiving corticosteroids to treat a relapse. Abdominal paracentesis recovers fluid containing 500,000 erythrocytes/mm³ and 5000 leukocytes/mm³.

Which of the following is the most likely diagnosis?

- A. Pneumococcal peritonitis*
- B. Staphylococcal peritonitis*
- C. Acute appendicitis*
- D. Mesenteric venous thrombosis*

Correct answer = A. Pneumococcal peritonitis

The question above would most likely be classified as shown in the table below.

Item Classification	
Content Domain/ Subdomain*	4. Glomerular disorders B. Nephropathies 2. Minimal change disease and variants
Universal Task	3. Diagnosis and Testing

*Note: Content domain/subdomain 4.B.2 can be found on page 4 of this document (within the detailed content outline section).

Exam Weights

The tables below indicate the exam weights (ie, the percentage of exam questions associated with each content domain and with each universal task) for the ABP's pediatric nephrology exams. The Content Domain/Subdomain weights are the same for the in-training and initial certification exam, but slightly different for the maintenance of certification exam. All three exams, however, share the same Universal Task weights.

Content Domain	Exam Weights	
	In-training & Initial Certification	Maintenance of Certification
1. Fetal and Neonatal Nephrology	6%	5%
2. Fluid, Electrolyte, and Acid-base Balance	10%	10%
3. Core Diagnostics	7%	7%
4. Glomerular Disorders	11%	11%
5. Acute Kidney Injury (including acute dialysis)	10%	10%
6. Cystic and Structural Disorders	6%	7%
7. Micturition, Urinary Tract Infection, Urolithiasis, and Renal Masses	6%	6%
8. Normal and Abnormal Blood Pressure	9%	9%
9. Chronic Kidney Disease and End-stage Renal Disease	11%	12%
10. Chronic Dialysis	9%	9%
11. Renal Transplantation	10%	10%
12. Core Knowledge in Scholarly Activities	5%	4%
	100%	100%

Universal Task	Exam Weights (In-training, initial certification, and maintenance of certification exams)
1. Core Science, Pathophysiology, and Pathogenesis	20%
2. Epidemiology and Risk Assessment	15%
3. Diagnosis and Testing	30%
4. Management and Treatment	35%
	100%

Detailed Content Outline

Domain 1: Fetal and Neonatal Nephrology

- A. Embryonic development and physiology of the kidneys and urinary tract
 - 1. Normal
 - 2. Abnormal
- B. Normal postnatal development and physiology of the kidney and bladder
 - 1. Renal circulation, vascular changes, glomerular filtration
 - 2. Tubular function
 - 3. Bladder function/micturition
- C. Abnormal postnatal development and physiology of the kidney and bladder
 - 1. Renal circulation, vascular changes, glomerular filtration
 - 2. Tubular function
 - 3. Bladder function/micturition

Domain 2: Fluid, Electrolyte, and Acid-base Balance

- A. Sodium and water balance
 - 1. Fluid and electrolyte requirements
 - 2. Disorders of sodium and water balance
- B. Other electrolyte disorders
 - 1. Potassium
 - 2. Calcium, magnesium, phosphorus
 - 3. Hyperosmolar syndromes
- C. Functional tubular disorders
- D. Acid-base disorders
 - 1. Primary renal
 - 2. Secondary (non-renal)

Domain 3: Core Diagnostics

- A. Urine assessments
- B. Renal structure/function assessments
 - 1. Glomerular filtration rate (GFR)
 - 2. Renal/bladder radiologic imaging
- C. Renal biopsy

Domain 4: Glomerular Disorders

- A. Hematuria and proteinuria
- B. Nephropathies
 - 1. Congenital and infantile nephrotic syndrome
 - 2. Minimal change disease and variants
 - 3. Focal segmental glomerulosclerosis
 - 4. Membranous nephropathy
 - 5. IgA nephropathy
 - 6. C3 nephropathy and membranoproliferative glomerulonephritis
- C. Nephropathies with systemic disease
 - 1. Post-infectious glomerulonephritis
 - 2. Lupus and related disorders
 - 3. Vasculitis and Goodpasture disease
 - 4. Thrombotic microangiopathies

- 5. Alport syndrome and other genetic nephritides
- 6. Infectious and other etiologies

Domain 5: Acute Kidney Injury (including acute dialysis)

- A. Prerenal azotemia
- B. Intrinsic AKI
- C. Post-renal AKI
- D. Renal replacement therapy in AKI
- E. Renal replacement therapy for other indications

Domain 6: Cystic and Structural Disorders

- A. Congenital anomalies of kidney and urinary tract
- B. Parenchymal cystic diseases and ciliopathies
 - 1. Polycystic kidney disease
 - 2. Other cystic diseases

Domain 7: Micturition, Urinary Tract Infection, Urolithiasis, and Renal Masses

- A. Micturition
- B. Urinary tract infection, bacteriuria, and pyuria
- C. Urolithiasis
 - 1. Calcium, uric acid
 - 2. Cystinuria, hyperoxaluria/oxalosis, struvite
- D. Renal masses

Domain 8: Normal and Abnormal Blood Pressure

- A. Physiology and pathophysiology of blood pressure regulation
- B. Primary and obesity-related hypertension
- C. Secondary hypertension

Domain 9: Chronic Kidney Disease and End-stage Renal Disease

- A. Staging chronic kidney disease/disease progression
- B. Mineral bone disorder (CKD-MBD)
- C. Anemia of CKD
- D. Growth and nutrition
- E. Cardiovascular Disease
- F. Central nervous system disease and disorders
 - 1. Development and cognitive disorders
 - 2. Neurologic disorders
- G. Drug metabolism
- H. Immunologic considerations
- I. Psychosocial issues in CKD

Domain 10: Chronic Dialysis

- A. Chronic hemodialysis
 - 1. Access, prescription, and adequacy
 - 2. Complications
- B. Chronic peritoneal dialysis
 - 1. Access, prescription, and adequacy
 - 2. Complications

C. Other considerations of dialysis/ESRD

Domain 11: Renal Transplantation

- A. Pretransplant considerations
 - 1. General issues
 - 2. Recipient evaluation
 - 3. Deceased and living donor assessment
- B. Immunosuppression
 - 1. Induction therapy
 - 2. Maintenance
- C. Allograft dysfunction and transplant complications
 - 1. Acute allograft dysfunction
 - 2. Acute rejection
 - 3. Chronic allograft nephropathy
 - 4. Recurrent and de novo diseases
 - 5. Opportunistic infections and post-transplant lymphoproliferative disorders (PTLD)
 - 6. Other complications/issues

Domain 12: Core Knowledge in Scholarly Activities

- A. Principles of Biostatistics in Research
 - 1. Types of variables
 - 2. Distribution of data
 - 3. Hypothesis testing
 - 4. Common statistical tests
 - 5. Measurement of association and effect
 - 6. Regression
 - 7. Diagnostic tests
 - 8. Systematic review and meta-analysis
- B. Principles of Epidemiology and Clinical Research Design
 - 1. Study design, performance, and analysis (internal validity)
 - 2. Generalizability (external validity)
 - 3. Bias and confounding
 - 4. Causation
 - 5. Incidence and prevalence
 - 6. Screening
 - 7. Cost benefit, cost effectiveness, and outcomes
 - 8. Measurement
- C. Ethics in Research
 - 1. Professionalism and misconduct in research
 - 2. Principles of research involving human subjects
 - 3. Principles of consent and assent
- D. Quality Improvement
 - 1. Project design
 - 2. Data and measurement