Pediatric Endocrinology
Content Outline

In-Training, Certification, and
Maintenance of Certification Exams

Effective for all examinations administered after October 1, 2023

THE AMERICAN BOARD *of* PEDIATRICS

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Overview

This content outline was developed to serve as the blueprint for pediatric endocrinology in-training, initial certification, and maintenance of certification examinations administered by the American Board of Pediatrics (ABP). 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 October 1, 2023. All pediatric endocrinology exams administered after this date will adhere to the specifications within this outline.

Development of the Pediatric Endocrinology Content Outline

The initial draft of this content outline was developed by a diverse, representative panel of practicing pediatric endocrinology subspecialists. The panel identified the knowledge required of pediatric endocrinologists in clinical practice and categorized that knowledge into content domains and subdomains. All board-certified pediatric endocrinologists (N = 1627) were then invited to provide feedback via an online survey. A total of 185 pediatric endocrinologists (11%) rated the relevance of the content areas within each content domain and provided an exam weight (ie, the percentage of exam questions) for each content domain. 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. A combination of the average recommended exam weights for each content domain and the relevance ratings for content areas within each content domain were used to create the exam weights which helps to ensure that ABP's pediatric endocrinology exams are measuring the full breadth of knowledge required for clinical practice.

Content Domains

The knowledge for safe and effective practice as a pediatric endocrinology subspecialist has been categorized into 19 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 endocrinology 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 Endocrinology Content Domains	
1.	Normal Physiology and Structural Development of Endocrine Systems
2.	Pharmacology
3.	Diabetes Mellitus
4.	Disorders of Growth
5.	Disorders of the Thyroid Gland
6.	Disorders of Puberty
7.	Disorders of the Adrenal Gland
8.	Disorders of the Hypothalamic-Pituitary Axis
9.	Hypoglycemia
10.	Disorders/Differences of Sex Development
11.	The Posterior Pituitary Gland and Disorders of Vasopressin and Water Metabolism
12.	Disorders of Weight Homeostasis
13.	Disorders of Mineral and Bone Metabolism
14.	Combined Endocrine Disorders and Enteric Neuroendocrine Tumors
15.	Lipid Disorders
16.	Gender Medicine
17.	Population Health and Screening
18.	Systems-Based Practice
19.	Core Knowledge in Scholarly Activities

Universal Tasks

To help ensure the clinical relevance of the pediatric endocrinology exams, the panel of pediatric endocrinology subspecialists also identified a set of four universal tasks that reflect the primary ways in which pediatric endocrinology knowledge can be applied in clinical practice. By classifying exam questions to a universal task category, an appropriate number of questions from each category can be included on all pediatric endocrinology exams. Each exam question that falls within content domains 3 through 15 (all of which address pediatric endocrinology disorders and conditions) is classified according to the universal task to which it is most closely aligned. If an exam question within those domains does not align with one of the universal tasks, it is removed from the question pool and is not included on an exam. The four universal task categories are as follows:

1. Pathophysiology: Understanding the molecular biology, cellular biology, hormone action, hormone measurement, and physiology of puberty and growth associated with acute and chronic pediatric endocrine disorders
2. Epidemiology and Risk Assessment: Recognizing patterns of acute and chronic pediatric endocrine disorders and understanding the variables that influence patters, including demographics, risk factors, risk stratification, natural history, and conditions that affect outcomes.
3. Diagnosis: Evaluating patients' recent (presenting) and earlier medical histories, family histories, and physical presentation; ordering appropriate laboratory and diagnostic testing; interpreting laboratory and radiologic testing results; utilizing resources, including but not limited to, genetic testing and imaging; distinguishing abnormal findings in family history, physical examination, laboratory values, and imaging data; developing a differential diagnosis list and prioritizing the evaluation of the most likely diagnoses; and consulting and referring patients to appropriate subspecialities when needed
4. Management and Treatment: Developing and documenting a patient-centered, cost-effective, clear, and fiscally responsible management plan for patients with pediatric endocrine disorders; recognizing the need for interdisciplinary care in managing rare endocrine disease and utilizing resources as needed; applying the use of medications knowledge; recognizing the psychosocial and mental health effects of chronic diseases for families; utilizing and interpreting findings from technology when managing patients with endocrine disorders; and recognizing and managing pediatric endocrine emergencies

Development and Classification of Exam Questions

Although the field of pediatric endocrinology 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 endocrinology subspecialist'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 their knowledge within each area is up to date.

To ensure all pediatric endocrinology 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 subspecialist. Each question is classified according to the content domain/subdomain to which it is most closely aligned, and any question classified within domains 3 through 15 is also classified to the universal task to which it is most closely aligned.

Once a question has been written, it is then discussed and revised, if necessary, by the pediatric endocrinology subboard, a diverse panel of practicing pediatric endocrinology subspecialists. During the revision process, each question is also reviewed multiple times by a medical editor to ensure accuracy and by ABP 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 are reviewed periodically for accuracy, currency, and relevance.

Sample Question

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

A 9-year-old boy has a 6-month history of progressive neurologic deterioration. His intellectual function and motor control have become impaired.

Which of the following concomitant conditions should be considered?

A. Adrenal insufficiency
B. Hypoparathyroidism
C. Hyperthyroidism
D. Type 1 diabetes

Correct answer = A. Adrenal insufficiency

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

Item Classification	
Content Domain/ Subdomain*	7. Disorders of the Adrenal Gland A. Adrenal insufficiency
Universal Task	3. Diagnosis

*Note: Content domain/subdomain 7.A can be found on page 6 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 for the ABP's pediatric endocrinology exams. The content domain/subdomain weights are the same for the in-training, initial certification, and maintenance of certification exams.

Content Domain	Exam Weights
1. Normal Physiology and Structural Development of Endocrine Systems	6%
2. Pharmacology	2%
3. Diabetes Mellitus	11%
4. Disorders of Growth	10%
5. Disorders of the Thyroid Gland	9%
6. Disorders of Puberty	8%
7. Disorders of the Adrenal Gland	7%
8. Disorders of the Hypothalamic-Pituitary Axis	6%
9. Hypoglycemia	5%
10. Disorders/Differences of Sex Development	5%
11. The Posterior Pituitary Gland and Disorders of Vasopressin and Water Metabolism	5%
12. Disorders of Weight Homeostasis	5%
13. Disorders of Mineral and Bone Metabolism	5%
14. Combined Endocrine Disorders and Enteric Neuroendocrine Tumors	3%
15. Lipid Disorders	3%
16. Gender Medicine	2%
17. Population Health and Screening	2%
18. Systems-Based Practice	2%
19. Core Knowledge in Scholarly Activities	4%
	100%

Detailed Content Outline

Domain 1: Normal Physiology and Structural Development of Endocrine Systems

A. Carbohydrate metabolism
   1. Insulin
   2. Glucagon
   3. Incretins and other regulatory hormones
   4. Glucose homeostasis
   5. Integrated hormone effects on metabolism

B. Bone and mineral metabolism
   1. Calciotropic hormones (PTH, calcitonin, vitamin D, FGF-23, PTH-RP, etc.)
   2. Renal mineral metabolism
   3. Structural and functional bone biology

C. Thyroid
   1. Embryology and neonatal thyroid function
   2. Synthesis and secretion of thyroid hormones (T3, T4)
   3. Thyroid hormone homeostasis (TRH, TSH, thyroid hormone binding proteins, etc.)

D. Adrenal
   1. Embryology and neonatal adrenal function
   2. Synthesis and secretion of adrenal cortical hormones (aldosterone, cortisol, and adrenal androgens)
   3. Regulation of adrenocortical function
   4. Hormones of the adrenal medulla

E. Pituitary/hypothalamus
   1. Embryology and developmental physiology of the pituitary gland
   2. Hypothalamic regulation of anterior pituitary function
   3. Hormones of the anterior pituitary (GH, FSH, LH, ACTH, TSH, prolactin)
   4. Hormones of the posterior pituitary and water metabolism (ADH, oxytocin)

F. Reproductive endocrine system
   1. Embryology and developmental physiology of the genitourinary system including the gonads
   2. Gonadal function and regulation
   3. Gonadal hormones (estrogens and androgens)
   4. Other reproductive hormones (inhibins, activins, AMH, etc.)

G. Growth
   1. The GH/IGF-1 axis
   2. Regulation of growth in the fetus, neonate, child, and adolescent

H. Basic science of endocrinology
   1. Basic molecular biology and genetics
   2. Hormone receptors and intracellular signaling
   3. Hormone assays

I. Miscellaneous endocrine topics
   1. Neuroendocrine hormones
   2. Enteric hormones
   3. Lipoproteins and lipids

Domain 2: Pharmacology

A. Carbohydrate metabolism
B. Bone and mineral metabolism
C. Thyroid
D. Adrenal
E. Pituitary/hypothalamus
F. Reproduction/puberty
G. Growth and growth-suppressing hormones
H. Lipoproteins and lipids
I. Anti-obesity medications

Domain 3: Diabetes Mellitus

A. Pre-diabetes
B. Type 1 diabetes
C. Type 2 diabetes
D. Gestational diabetes
E. Neonatal diabetes
F. Monogenic forms of diabetes
G. Medication-induced diabetes
H. Cystic fibrosis-related diabetes
I. Rare forms of diabetes

Domain 4: Disorders of Growth

A. Short stature
B. Congenital and acquired GH deficiency
C. Disorders of GH action and GH sensitivity (primary IGF-1 deficiency)
D. Idiopathic short stature
E. Syndromes associated with short stature
F. Growth disorders not related to the GH-IGF axis
G. Skeletal dysplasia
H. Effects of chronic illness on growth including cancer therapy
I. Tall stature
J. Overgrowth syndromes

Domain 5: Disorders of the Thyroid Gland

A. Hypothyroidism
B. Hyperthyroidism
C. Thyroiditis
D. Developmental disorders of the thyroid
E. Goiter
F. Thyroid nodules and cancer
G. Disorders of the TSH receptor, thyroid hormone receptor, and thyroid hormone carriers

Domain 6: Disorders of Puberty

A. Precocious puberty
B. Delayed puberty
C. Genetic syndromes with abnormal puberty

D. Oligomenorrhea and amenorrhea
E. Gynecomastia

Domain 7: Disorders of the Adrenal Gland

A. Adrenal insufficiency
B. Congenital adrenal hyperplasia
C. Adrenal hormone excess
D. Adrenal tumors
E. Disorders of the adrenal medulla

Domain 8: Disorders of the Hypothalamic-Pituitary Axis

A. Isolated pituitary hormone deficiencies and excesses
B. Combined pituitary hormone deficiencies (CPHD) (genetic and acquired)
C. Pituitary tumors
D. Developmental defects of the midline
E. Central nervous system tumors

Domain 9: Hypoglycemia

A. Hypoglycemia in newborn infants
B. Hypoglycemia in infants and children

Domain 10: Disorders/Differences of Sex Development

A. Ambiguous genitalia
B. Disturbances of testicular/ovarian hormone production or action
C. Impaired gonadal development
D. Sexual differentiation

Domain 11: The Posterior Pituitary Gland and Disorders of Vasopressin and Water Metabolism

A. Diabetes insipidus
B. The syndrome of inappropriate secretion of antidiuretic hormone
C. Other causes of hyponatremia, hypernatremia, and polydipsia

Domain 12: Disorders of Weight Homeostasis

A. Metabolic complications of obesity
B. Obesity due to endocrine disease
C. Obesity due to overnutrition
D. Obesity due to hypothalamic disease
E. Monogenic and syndromic obesity
F. Undernutrition

Domain 13: Disorders of Mineral and Bone Metabolism

A. Hypocalcemia
B. Hypercalcemia
C. Disorders of phosphate metabolism
D. Bone disease and prematurity (BDP)
E. Disorders of bone mineralization and matrix

Domain 14: Combined Endocrine Disorders and Enteric Neuroendocrine Tumors

A. Autoimmune polyglandular syndrome
B. Multiple endocrine neoplasia
C. Enteric neuroendocrine tumors (eg, VIPoma, somatostatinoma, etc.)

Domain 15: Lipid Disorders

A. Secondary lipid disorders
B. Genetic lipid disorders

Domain 16: Gender Medicine

A. Medical therapy and care for transgender youth
B. Medical therapy and care for nonbinary youth

Domain 17: Population Health and Screening

A. Newborn screening for endocrine disorders
B. Screening for comorbidities of obesity including diabetes
C. Epidemiology of endocrine disorders

Domain 18: Systems-Based Practice

A. Communication with team members and families (eg, structured handoff processes and closed-loop communication, patient, and family education, etc.)
B. Care coordination (eg, clinical documentation, health information privacy regulations, community resources such as school nurses, transition of care, etc.)
C. Social determinants of health (eg, health disparities, care delivery and access to underserved populations, resource utilization and capacity, disaster preparedness, etc.)
D. Behavior and mental health conditions associated with endocrine disoders
E. Signs and symptoms of psychological trauma and burnout in self, peers, team members, and caregivers
F. Fiscal responsibility and care management (eg, payer reimbursement models, coding, documentation, patient support programs, etc.)

Domain 19: Core Knowledge in Scholarly Activities

A. Principles of biostatistics in research
    1. Types of variables (eg, continuous, ordinal, nominal, etc.)
    2. Distribution of data (eg, mean, standard deviation, skewness, etc.)
    3. Hypothesis testing (eg, type I and type II errors, P values, statistical power, etc.)
    4. Common statistical tests (eg, analysis of variance [ANOVA], chi-square, nonparametric tests, etc.)
    5. Measurement of association and effect (eg, correlation, relative risk, odds ratio, etc.)
    6. Regression (eg, linear, logistic, survival analysis, etc.)
    7. Diagnostic tests (eg, sensitivity and specificity, predictive values, disease prevalence, receiver- operating characteristic [ROC] curves, etc.)
    8. Systematic review and meta-analysis
    9. Qualitative research methods and 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 (eg, validity, reliability, etc.)

C. Ethics in research
1. Professionalism and misconduct in research (eg, conflicts of interest, falsification, etc.)
2. Principles of research involving human subjects
3. Principles of consent and assent

D. Quality improvement and patient safety
1. Project design (eg, models, aims, key drivers, tools, Plan-Do-Study-Act [PDSA] cycle, etc.)
2. Data and measurement (eg, outcomes, balancing measures, run charts, control charts, common cause, and special cause variation, etc.)