Pediatric Rheumatology
Content Outline

In-Training, Certification, and
Maintenance of Certification Exams

Effective for all examinations administered March 1, 2023 and after

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Overview

This content outline was developed to serve as the blueprint for pediatric rheumatology 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 March 1, 2023. All pediatric rheumatology exams administered after this date will adhere to the specifications within this outline.

DEVELOPMENT OF THE PEDIATRIC RHEUMATOLOGY CONTENT OUTLINE

The initial draft of this content outline was developed by a diverse, representative panel of practicing pediatric rheumatology subspecialists. The panel identified the knowledge required of pediatric rheumatologists in clinical practice and categorized that knowledge into content domains and subdomains. All board-certified pediatric rheumatologists (N = 413) were then invited to provide feedback via an online survey. A total of 141 pediatric rheumatologists (34%) 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 rheumatology exams are measuring the full breadth of knowledge required for clinical practice.

CONTENT DOMAINS

The knowledge for safe and effective practice as a pediatric rheumatology subspecialist has been categorized into 18 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 rheumatology 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 Rheumatology Content Domains
1. Anatomy, Genetics, and Physiology
2. Drug Therapy
3. Juvenile Idiopathic Arthritis (JIA) and Associated Disorders
4. SLE and SLE-Related Organ Involvement
5. Vasculitis and Related Disorders
6. Idiopathic Inflammatory Myositis (IIM) and Associated Disorders
7. Sclerodermas and Related Disorders
8. Autoinflammatory Disorders
9. Other Rheumatic and Inflammatory Disorders
10. Non-inflammatory Musculoskeletal Pain
11. Musculoskeletal Conditions Related to Infection
12. Dermatologic Disorders and Mimics of Rheumatic Disorders
13. Musculoskeletal Manifestations of Other Chronic Disorders
14. Bone and Connective Tissue Disorders
15. Primary Immunodeficiencies
16. Skeletal Lesions and Neoplasms
17. Communication, Care Coordination, and Psychological Support
18. Core Knowledge in Scholarly Activities

UNIVERSAL TASKS

To help ensure the clinical relevance of the pediatric rheumatology exams, the panel of pediatric rheumatology subspecialists also identified a set of four universal tasks that reflect the primary ways in which pediatric rheumatology 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 rheumatology exams. Each exam question that falls within content domains 3 through 16 (all of which address pediatric rheumatic diseases, rheumatic disease associations, and musculoskeletal 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 anatomic, molecular, cellular, and physiological processes associated with pediatric rheumatic and autoinflammatory diseases, rheumatic manifestations of other disorders (infections, neoplasms, other systemic disorders, etc.), and other musculoskeletal conditions
2. **Epidemiology and Risk Assessment:** Recognizing patterns of pediatric rheumatic conditions and understanding the variables that influence those patterns, including demographics, risk factors, risk stratification, natural history, prognosis, and conditions that affect outcomes
3. **Diagnosis:** Evaluating patients with manifestations potentially related to rheumatologic diseases and other musculoskeletal conditions; performing general and specialized history and physical examinations; ordering and interpreting results from laboratories, diagnostic testing, and imaging; and referring patients to appropriate subspecialties when needed
4. **Management and Treatment:** Applying guidelines and evidence to inform the care of patients; developing and documenting patient-centered and cost-effective management plans that address the primary problem and all co-morbidities; applying knowledge of the mechanisms of action, formulations, indications for usage, dosing, risks, benefits, treatment outcomes, and potential complications to the use of medications; and interpreting clinical, laboratory, and imaging information to assess disease activity, damage, and potential drug toxicity; and rehabilitative management

DEVELOPMENT AND CLASSIFICATION OF EXAM QUESTIONS

Although the field of pediatric rheumatology 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 rheumatology 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 rheumatology 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 16 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 rheumatology subboard, a diverse panel of practicing pediatric rheumatology 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 child with enthesitis-related arthritis has an intermittent limp despite treatment with naproxen. MRI reveals bone marrow edema adjacent to the sacroiliac joint.

Therapy with which of the following is most likely to be beneficial in this patient?

    A. Abatacept
    B. Adalimumab
    C. Methotrexate
    D. Sulfasalazine

Correct answer = B. Adalimumab

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

Item Classification	
Content Domain/ Subdomain*	3. Juvenile Idiopathic Arthritis (JIA) and Associated Disorders E. Enthesitis-related JIA
Universal Task	4. Management and Treatment

*Note: Content domain/subdomain 3.E 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 for the ABP's pediatric rheumatology 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. Anatomy, Genetics, and Physiology	6%
2. Drug Therapy	5%
3. Juvenile Idiopathic Arthritis (JIA) and Associated Disorders	17%
4. SLE and SLE-Related Organ Involvement	14%
5. Vasculitis and Related Disorders	9%
6. Idiopathic Inflammatory Myositis (IIM) and Associated Disorders	8%
7. Sclerodermas and Related Disorders	6%
8. Autoinflammatory Disorders	5%
9. Other Rheumatic and Inflammatory Disorders	4%
10. Non-Inflammatory Musculoskeletal Pain	4%
11. Musculoskeletal Conditions Related to Infection	3%
12. Dermatologic Disorders and Mimics of Rheumatic Disorders	3%
13. Musculoskeletal Manifestations of Other Chronic Disorders	3%
14. Bone and Connective Tissue Disorders	3%
15. Primary Immunodeficiencies	2%
16. Skeletal Lesions and Neoplasms	2%
17. Communication, Care Coordination, and Psychological Support	2%
18. Core Knowledge in Scholarly Activities	4%
	100%

Detailed Content Outline

Domain 1: Anatomy, Genetics, and Physiology

A. Inflammation and immunity
B. Musculoskeletal systems
C. Principles of genetics
D. Structure of connective tissue

Domain 2: Drug Therapy

A. Mechanisms of action and clinical pharmacology
B. Indications and contraindications
C. Drug toxicity and adverse effects
D. Interactions
E. Adjunct therapy including supplementary medications, vaccinations, and contraception
F. Drug therapy in pregnant patients and other high-risk populations

Domain 3: Juvenile Idiopathic Arthritis (JIA) and Associated Disorders

A. Oligoarticular JIA
B. RF-positive polyarticular JIA
C. RF-negative polyarticular JIA
D. Systemic JIA
E. Enthesitis-related JIA
F. Psoriatic JIA
G. JIA-associated and idiopathic uveitis

Domain 4: Systemic Lupus Erythematosus (SLE) and SLE-Related Organ Involvement

A. Lupus nephritis
B. Mucocutaneous disease
C. Hematologic manifestations
D. Central nervous system disease
E. Cardiac disease
F. Pulmonary disease
G. Musculoskeletal manifestations
H. Gastrointestinal and hepatic disease
I. Drug-induced lupus
J. Endocrine manifestations
K. Ocular manifestations
L. Neonatal lupus erythematosus
M. Immunologic abnormalities

Domain 5: Vasculitis and Related Disorders

A. Kawasaki disease
B. IgA vasculitis
C. Granulomatosis with polyangiitis
D. Polyarteritis nodosa
E. Microscopic polyangiitis
F. Takayasu arteritis

G. Behcet disease
H. Hypersensitivity vasculitis and serum sickness
I. Primary angiitis of the central nervous system
J. Cutaneous polyarteritis nodosa
K. Urticarial vasculitis
L. Eosinophilic granulomatosis with polyangiitis
M. Cogan syndrome
N. Vasculitis associated with cryoglobulinemia

Domain 6: Idiopathic Inflammatory Myositis (IIM) and Associated Disorders

A. Juvenile dermatomyositis
B. Organ involvement in IIM
C. Calcinosis
D. Juvenile polymyositis
E. Lipodystrophy and insulin resistance
F. Immune-mediated necrotizing myopathy

Domain 7: Sclerodermas and Related Disorders

A. Localized scleroderma
B. Systemic sclerosis
C. Organ involvement in systemic sclerosis
D. Linear scleroderma en coup de sabre
E. Eosinophilic fasciitis

Domain 8: Autoinflammatory Disorders

A. Periodic fever, aphthous stomatitis, pharyngitis and adenitis (PFAPA) syndrome
B. Sarcoidosis and Blau syndrome
C. TNF receptor-associated periodic syndrome (TRAPS)
D. Familial Mediterranean fever (FMF)
E. Idiopathic inflammatory disease of the bone (chronic non-infectious osteomyelitis, synovitis, acne, pustulosis, hyperostosis and osteitis [SAPHO], etc.)
F. Mevalonate kinase deficiency (mild) (hyper IgD syndrome)
G. NLRP3-associated autoinflammatory disease
H. Miscellaneous autoinflammatory diseases (eg, pyogenic arthritis, pyoderma gangrenosum, and acne [PAPA]; deficiency of the IL-1 receptor antagonist [DIRA]; STING-associated vasculopathy with onset in infancy [SAVI]; deficiency of adenosine deaminase 2 [DADA2]; NLR Family CARD Domain Containing 4 [NLRC4]; Aicardi-Goutières; deficiency of IL-36 receptor antagonist [DITRA]; proteasome-associated autoinflammatory syndromes [PRAAS]; A20 haploinsufficiency)

Domain 9: Other Rheumatic and Inflammatory Disorders

A. Raynaud phenomenon and pernio
B. Hemophagocytic lymphohistiocytosis/macrophage activation syndrome
C. Overlap syndromes
    1. Mixed connective tissue disease
    2. Non-specific overlap syndromes
D. Antiphospholipid antibody syndrome
E. Sjögren syndrome
F. IgG4-related disease and retroperitoneal fibrosis

G. Relapsing polychondritis
H. Autoimmune neurologic diseases (eg, autoimmune encephalitis, Hashimoto encephalitis, etc.)
I. Kikuchi-Fujimoto disease
J. Erythromelalgia
K. Castleman disease

Domain 10: Non-Inflammatory Musculoskeletal Pain

A. Diffuse and regional amplified pain syndromes
B. Hypermobility and syndromes associated with hypermobility (Ehlers-Danlos, Marfan, etc.)
C. Patellofemoral syndrome
D. Growing pains
E. Costochondritis
F. Orthopedic conditions presenting with pain (eg, osteochondroses, slipping rib syndrome, Perthes disease, slipped capital femoral epiphysis, chondrolysis, femoral acetabular impingement, Scheuermann disease, tarsal coalitions, spondylolysis and spondylolisthesis, pes planus, and pain associated with trauma and overuse)
G. Non-inflammatory musculoskeletal pain in the context of rheumatic disease

Domain 11: Musculoskeletal Conditions Related to Infection

A. Reactive arthritis
B. Transient synovitis of the hip
C. Musculoskeletal manifestations caused by pathogenic organisms (eg, septic arthritis, Lyme arthritis, viruses, mycobacteria, etc.)
D. Acute rheumatic fever and post-streptococcal inflammatory disease
E. Osteomyelitis
F. Diskitis

Domain 12: Dermatologic Disorders and Mimics of Rheumatic Disorders

A. Panniculitis/erythema nodosum
B. Neutrophilic dermatoses (eg, Sweet syndrome, pyoderma gangrenosum, etc.)
C. Granuloma annulare/benign rheumatoid nodules
D. Stevens-Johnson syndrome
E. Pachydermodactyly
F. Foreign body synovitis
G. Lymphedema

Domain 13: Musculoskeletal Manifestations of Other Chronic Disorders

A. Inflammatory bowel disease
B. Celiac disease
C. Psychiatric and neurologic disorders (eg, somatic syndrome disorder, conversion disorder, dystrophies, myasthenia gravis, etc.)
D. Endocrine disease (eg, thyroid disease, adrenal insufficiency, etc.)
E. Hematologic disorders (eg, bleeding disorders, sickle cell disease, etc.)
F. Cystic fibrosis
G. Storage diseases (eg, Gaucher disease, Fabry disease, mucopolysaccharidoses mucolipidoses, etc.)

Domain 14: Bone and Connective Tissue Disorders

A. Osteoporosis/osteopenia
B. Nutritional disorders (eg, vitamin A, C, and D deficiencies)
C. Chromosomal disorders (eg, trisomy 21, 22q Deletion, Turner syndrome, etc.)
D. Soft tissue calcification and skeletal dysplasias
E. Hyperostosis syndromes (eg, Caffrey disease)
F. Gout and hyperuricemia

Domain 15: Primary Immunodeficiencies

A. Complement deficiencies
B. Immune dysregulation syndromes
C. Antibody deficiencies
D. Autoimmune lymphoproliferative syndrome
E. T-cell deficiencies
F. Myeloid deficiencies

Domain 16: Skeletal Lesions and Neoplasms

A. Hematologic malignancies and histiocytic disorders
B. Skeletal lesions (eg, bone cysts)
C. Solid tumors

Domain 17: Communication, Care Coordination, and Psychological Support

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, individualized educational plans, 504 plans, transition of care, etc.)
C. Fiscal responsibility and care management (eg, payer reimbursement models, coding, documentation, patient support programs, etc.)
D. Behavioral and mental health conditions associated with rheumatic diseases

Domain 18: 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 and patient safety
   1. Project design/PDSA
   2. Data and measurement