



# Pediatric Dermatology—A Review for the Pediatric Provider

Anthony J. Mancini, MD, FAAP, FAAD

Pediatricians and other pediatric providers are often faced with clinical care issues in pediatric dermatology, a field in which many receive little to no formal training. Given the ongoing national shortage of pediatric dermatologists (or access to dermatologists with expertise/interest in caring for children), the need for education in dermatology persists, as the primary care provider must often diagnose and manage these patients on their own, or while the patient awaits specialty evaluation (which may exceed several months). Studies of the dermatology workforce have consistently demonstrated a short supply of “medical dermatologists” (those with a primarily medical, versus surgical or cosmetic, practice). As of 2019, a total of 283 pediatric dermatologists have been board certified in the United States (since the inaugural examination in 2004);<sup>1</sup> fellowship training in pediatric dermatology adds only 15 to 20 board-eligible pediatric dermatologists to this pool yearly. In a survey of board-certified pediatric dermatologists, greater than 25% had a new patient appointment wait time exceeding 10 weeks.<sup>1</sup> It has been estimated that 86% of “specialty dermatologists” (ie, pediatric dermatologists) practice in cities with a population greater than

100,000,<sup>2</sup> highlighting a large underserved patient population.

A 2016 review of the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey databases for physician visits for children between birth and age 18 years revealed that 23 million (9%) of all outpatient pediatric visits included 1 of the 23 most common dermatologic diagnoses.<sup>3</sup> The majority of skin disorders in children are seen by pediatricians and other primary care practitioners,<sup>4</sup> and studies have shown that diagnosis of skin disease by nondermatologists is suboptimal, and the different levels of experience between the dermatologist and nondermatologist may affect the quality of dermatologic care.<sup>5</sup> As such, it has been suggested that development of pediatric dermatology curricula for primary care providers and the planning of educational programs designed to teach these providers about dermatological diseases will likely improve dermatologic care.<sup>1,4,5</sup>

It is my pleasure to serve as guest editor for this issue of *Pediatric Annals* dedicated to pediatric dermatology, and it is my hope that these concise, yet complete, articles will help guide you in the care of your patients with skin disease. In the first

article, “Acne Vulgaris: Treatment Made Easy for the Primary Care Physician,” Drs. Katherine Berry, Jordan Lim, and Andrea L. Zaenglein discuss this extremely common disorder affecting pre-adolescents and adolescents. The article begins with a brief review of pathogenesis, which is vital to understand as it assists in designing a therapeutic plan. They then discuss categorization and grading of acne, followed by common-sense approach to treatments. Acne therapy according to disease severity, acne maintenance therapy, and indications for referral are all outlined, and this is followed by a discussion of the most relevant medication classes and agents. A brief discussion of hormonal therapies and oral isotretinoin is included, as are several helpful figures and tables. This article will be useful to any practitioner who wishes to learn, update, and/or reinforce the standards of care in treating pediatric acne.

In the second article, “Exanthematous Eruptions in Children,” Trevor K. Young and Dr. Vikash S. Oza review several childhood exanthems. In this article, the authors discuss the recent resurgence in measles infection and review the cardinal clinical features of this illness, which may be unfamiliar to many practitioners. They include a

description of extracutaneous features, diagnostic guidelines, and current treatment recommendations. The section on hand, foot and mouth disease reviews not only the classic disorder, but the more contemporary presentation when associated with Coxsackievirus A6 infection. In their review of parvovirus B19 exanthems, the authors review papular purpuric gloves and socks syndrome, a more recently described presentation that has different epidemiologic implications for people who have been exposed. Varicella in the era of universal varicella immunization is briefly discussed, along with breakthrough varicella and herpes zoster in children. The authors conclude with a discussion of *Mycoplasma pneumoniae*-associated skin disorders, including classic Stevens-Johnson syndrome, and the newly described *M. pneumoniae*-induced rash and mucositis, along with potential complications and long-term sequelae.

In the next article, “Infestations, Bites, and Insect Repellents,” Drs. Sonia Kamath and Brandi Kenner-Bell review a variety of common childhood skin infestations, bite reactions, and the safe use of insect repellents in children. The article begins with an updated discussion of lice (with particular focus on head lice) and includes a discussion and summary table on the many therapeutic options available to the clinician. A discussion on scabies follows and includes a description of variant presentations as well as entities which may be considered in the differential. The authors include a table that outlines several other human and animal mite infestations, as well as a review of common bite reactions, including those caused by fleas and bed bugs. Papular urticaria, a delayed type hypersensitivity response to a variety of biting arthro-

pods that may be misdiagnosed if not considered, is also reviewed, and the article ends with a review of insect repellents and their safe and effective use in children. This information is particularly important in the era of increasing arthropod-borne infections such as dengue, malaria, West Nile virus, chikungunya, and Zika virus.

In the fourth article, “Cutaneous Drug Eruptions in Pediatrics—A Primer,” Drs. Caroline E. Perez and Jonathan A. Dyer review drug reactions in pediatrics. They begin with a review of cutaneous drug reactions in children, including their categorization and an interesting brief discussion on overdiagnosis of penicillin allergy. The authors then proceed to discuss several distinct drug reaction patterns, including their clinical appearance, classification, severity, time to onset (from exposure), and common offending agents. Their discussion includes urticaria, serum sickness-like reaction, urticaria multiforme, erythema multiforme, and morbilliform/exanthematous drug reactions. Potentially severe reactions are briefly addressed, including Stevens-Johnson syndrome, toxic epidermal necrolysis, and drug reaction with eosinophilia and systemic symptoms. The latter is notable for its distinct presentation and possible association with extracutaneous organ involvement, especially liver inflammation and delayed-onset thyroid disease. Prior to their discussion on diagnostic testing, management, and prevention, the authors briefly review hypersensitivity vasculitis, acute generalized exanthematous pustulosis, and symmetric drug-related intertriginous and flexural erythema. This article contains useful information that should be familiar to all pediatric clinicians.

In the final article, “Atopic Dermatitis: Update on Pathogenesis and

Therapy,” Drs. Norma Olivia de la O-Escamilla and Robert Sidbury bring readers up to date on this common and potentially life-altering disorder. The authors first review the evolving observations regarding comorbidities in patients with atopic dermatitis (AD), including attention-deficit/hyperactivity disorder. This is followed by a contemporary update on AD pathogenesis, including newer observations on the roles of epidermal barrier dysfunction, cutaneous microbiome interactions, and host immune dysregulation. The authors then summarize treatment approaches, beginning with traditional first-line options and the roles of antimicrobial therapy and antihistamine use. Topical therapies including corticosteroids, calcineurin inhibitors, and phosphodiesterase 4 inhibitors are reviewed next, followed by a brief update on phototherapy in children. The authors end with a discussion of systemic AD therapies, including the first approved biologic agent, dupilumab, and pipeline therapies currently in clinical trials. This article succinctly brings readers up to date on the rapidly changing landscape of AD therapeutic approaches.

These articles are packed with useful information for any pediatric provider who wants to advance their skills in caring for childhood cutaneous diseases. I am thankful to my colleagues who accepted the invitation to share their expertise and experience. I hope you enjoy the issue.

## REFERENCES

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### About the Guest Editor

**Anthony J. Mancini, MD, FAAP, FAAD**, is a Professor of Pediatrics and Dermatology at Northwestern University Feinberg School of Medicine and the Head of the Division of Pediatric Dermatology at Ann & Robert H. Lurie Children's Hospital of Chicago, where he directs the division's pediatric dermatology fellowship training program. He is a Fellow of both the American Academy of Dermatology and the American Academy of Pediatrics.

Dr. Mancini's clinical and research interests include infantile hemangiomas, atopic dermatitis, and neonatal skin maturation and skin disorders. He has published over 220 peer-reviewed articles, abstracts, books, and book chapters. He is co-author of *Hurwitz Clinical Pediatric Dermatology* (3rd, 4th, 5th, and upcoming 6th editions), co-editor of the American Academy of Pediatrics (AAP) publication *Pediatric Dermatology – A Quick Reference Guide* (1st, 2nd, 3rd, and upcoming 4th editions), and Pediatric Section Editor of *Dermatology* (1st, 2nd, and 3rd editions). Dr. Mancini is Past President of the Society for Pediatric Dermatology, where he also served for 10 years as Secretary-Treasurer, and past Program Chair of the 2017 World Congress of Pediatric Dermatology. He has previously served on the AAP Executive Committee of the Section on Dermatology, the AAP Super CME (continuing medical education) Planning Group, and the AAP Pedia Link Pediatric Dermatology Project Team, and is an author of the recently-published *AAP Clinical Practice Guidelines on Infantile Hemangiomas*.

Address correspondence to Anthony J. Mancini, MD, FAAP, FAAD, via email at [amancini@northwestern.edu](mailto:amancini@northwestern.edu).