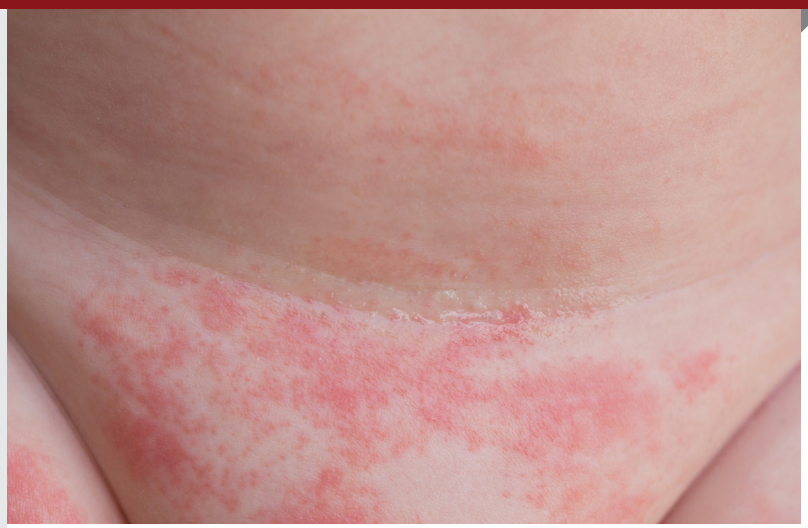
DECEMBER 2025 | VOLUME 22 | ISSUE 12

PEDIATRIC
Emergency Medicine Practice
Evidence-Based Education • Practical Application

CLINICAL CHALLENGES

- Which neonatal rashes require additional evaluation?
- What testing can help quickly risk-stratify patients in need of medications?
- When do negative cultures not rule out a diagnosis?
- Which conditions require quick referral to dermatology?



Management of Neonatal Rashes in the Emergency Department

Authors

Chelsey Mitchell, MD
Fellow of Pediatrics in Emergency Medicine, New York-Presbyterian Morgan Stanley Children's Hospital, New York, NY

Christine T. Lauren, MD, MHA
Associate Professor of Dermatology and Pediatrics, Columbia University Vagelos College of Physicians and Surgeons and New York-Presbyterian Hospital, New York, NY

Kelsey Fawcett, MB, BCh, BAO
Assistant Professor of Pediatrics in Emergency Medicine, New York-Presbyterian Morgan Stanley Children's Hospital, New York, NY

Peer Reviewers

Sylvia E. Garcia, MD
Assistant Professor of Pediatric Emergency Medicine, Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, NY

Victoria Gregg, MD
Assistant Professor of Pediatrics, Dell Medical School, The University of Texas at Austin, Austin, TX

Prior to beginning this activity, see the "CME Information" on page 2.

Abstract

While most cases of neonatal rashes are benign and self-limited, certain neonatal skin conditions require prompt diagnosis and targeted treatment to prevent severe morbidity and mortality. Recognition of high-risk neonatal rashes and early intervention can significantly improve patient outcomes. Categorizing the rash can help delineate a differential diagnosis and determine whether the presentation and physical examination have features of a high-risk rash. This issue offers a strategic approach to the evaluation of neonatal skin conditions and offers guidance for differentiating benign findings from those that should raise concern and lead to further evaluation and management.

EB MEDICINE

For online access:

CME Information

Date of Original Release: December 1, 2025. Date of most recent review: November 1, 2025. Termination date: December 1, 2028.

Accreditation: EB Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

Credit Designation: EB Medicine designates this enduring material for a maximum of *4 AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Specialty CME: Included as part of the 4 credits, this CME activity is eligible for 2 Infectious Disease CME credits, subject to your state and institutional approval.

ACEP Accreditation: *Pediatric Emergency Medicine Practice* is approved by the American College of Emergency Physicians for 48 hours of ACEP Category I credit per annual subscription.

AAP Accreditation: This continuing medical education activity has been reviewed by the American Academy of Pediatrics and is acceptable for a maximum of 48 AAP credits. These credits can be applied toward the AAP CME/CPD Award available to Fellows and Candidate Members of the American Academy of Pediatrics.

AOA Accreditation: *Pediatric Emergency Medicine Practice* is eligible for up to 4 American Osteopathic Association Category 2-B credit hours per issue.

Needs Assessment: The need for this educational activity was determined by a practice gap analysis; a survey of medical staff, including the editorial board of this publication; review of morbidity and mortality data from the CDC, AHA, NCHS, and ACEP; and evaluation responses from prior educational activities for emergency physicians.

Target Audience: This enduring material is designed for emergency medicine physicians, physician assistants, nurse practitioners, and residents.

Goals: Upon completion of this activity, you should be able to: (1) identify areas in practice that require modification to be consistent with current evidence in order to improve competence and performance; (2) develop strategies to accurately diagnose and treat both common and critical ED presentations; and (3) demonstrate informed medical decision-making based on the strongest clinical evidence.

CME Objectives: Upon completion of this activity, you should be able to: (1) identify neonatal rashes that require additional evaluation; (2) describe initial evaluation and management based on the differential diagnosis of select skin findings; and (3) determine necessary disposition planning for neonates presenting with select skin findings.

Discussion of Investigational Information: As part of the activity, faculty may be presenting investigational information about pharmaceutical products that is outside Food and Drug Administration-approved labeling. Information presented as part of this activity is intended solely as continuing medical education and is not intended to promote off-label use of any pharmaceutical product.

Disclosure: It is the policy of EB Medicine to ensure objectivity, balance, independence, transparency, and scientific rigor in all CME activities. All individuals in a position to control content have disclosed all financial relationships with ACCME-defined ineligible companies. EB Medicine has assessed all relationships with ineligible companies disclosed, identified those financial relationships deemed relevant, and appropriately mitigated all relevant financial relationships based on each individual's role(s). Please find disclosure information for this activity below:

Planners

- Ilene Claudius, MD (Editor-in-Chief): Has no relevant financial relationships with ineligible companies
- Tim Horeczko, MD, PhD, MSCR (Editor-in-Chief): Has no relevant financial relationships with ineligible companies

Faculty

- Chelsey Mitchell, MD (Author): Has no relevant financial relationships with ineligible companies
- Christine T. Lauren, MD, MHA (Author): Sanofi Regeneron (consultant/advisor)
- Kelsey Fawcett, MB, BCh, BAO (Author): Has no relevant financial relationships with ineligible companies
- Sylvia E. Garcia, MD (Peer Reviewer): Has no relevant financial relationships with ineligible companies
- Victoria Gregg, MD (Peer Reviewer): Has no relevant financial relationships with ineligible companies
- Aimee Mishler, PharmD (Pharmacology Editor): Has no relevant financial relationships with ineligible companies
- Brian Skrainka, MD (CME Question Editor): Has no relevant financial relationships with ineligible companies
- Cheryl Belton, PhD (Content Editor): Has no relevant financial relationships with ineligible companies
- Dorothy Whisenhunt, MS (Content Editor): Has no relevant financial relationships with ineligible companies

Earning CME Credit: Learners can earn credit by visiting www.ebmedicine.net and selecting the test they wish to complete. To receive credit, they must score 100% on the test and complete the evaluation. After completing these steps, a CME certificate will be emailed to them.

Additional Policies: For additional policies, including our statement of conflict of interest, source of funding, statement of informed consent, and statement of human and animal rights, visit http://www.ebmedicine.net/policies.

EB MEDICINE

Direct all inquiries to:
Phone: 678-366-7933
Fax: 770-500-1316
5600 Spalding Drive, Unit 921697
Norcross, GA 30010-1697
E-mail: **ebm@ebmedicine.net**
Website: **www.ebmedicine.net**

Chief Executive Officer: Stephanie Williford
Publisher: Suzanne Verity
Director of Editorial Quality: Dorothy Whisenhunt, MS
Senior Content Editor: Cheryl Belton, PhD, ELS
Senior Content Editor: Anneke Smith, MS
Managing Editor, Product Development: Angie Wallace
CME & Content Manager: Kristen Raynor, MEd
Associate Content Editor: Lindsay Petracek
Database Administrator: Jose Porras
Education Coordinator: Kandis Slater
Director of Operations: Robin Wilkinson
Director of Technology: Anna Motuz, MBA
Director of Revenue Growth: Bill Dugan
Senior Account Executive: Dana Stenzel
Conversion Optimization Marketing Specialist: Saylor Green
Marketing Specialist: Valerie Yuhouse
Marketing Specialist: Becky Smith
Marketing Coordinator: Stephanie Allen
Sales Support Specialist: Jack Dugan
Customer Service Representative: Katie Resumovic

EVIDENCE-BASED AI-FREE CONTENT PEER-REVIEWED

EB Medicine's Statement on the Use of Artificial Intelligence (AI) Tools in Content Production
At EB Medicine, we produce content for emergency medicine and urgent care clinicians that is evidence-based and peer reviewed, and at the same time infused with an understanding of the realities of clinical practice, human behavior, and institutional and social limitations that only humans can apply. For these reasons, EB Medicine assures our readers and subscribers that all authors of our content have certified that they have not used generative AI-assisted technology in the writing of their manuscript and that clinical pathways and images are human-designed. For more information, go to www.ebmedicine.net/AI

ISSN info and disclaimer:

Pediatric Emergency Medicine Practice (ISSN Print: 1549-9650, ISSN Online: 1549-9669, ACID-FREE) is published monthly (12 times per year) by EB Medicine (5600 Spalding Drive, Unit 921697, Norcross, GA 30010-1697). Opinions expressed are not necessarily those of this publication. Mention of products or services does not constitute endorsement. This publication is intended as a general guide and is intended to supplement, rather than substitute, professional judgment. It covers a highly technical and complex subject and should not be used for making specific medical decisions. The materials contained herein are not intended to establish policy, procedure, or standard of care. *Pediatric Emergency Medicine Practice* is a trademark of EB Medicine.

Case Presentations

CASE 1

A first-time mother brings in her 10-day-old boy because of a rash she noticed earlier in the day...

- On arrival, the infant had a rectal temperature of 37.3°C and a heart rate of 156 beats/min. The nurse reports that he appears well overall. The mother tells you that she has no medical history, the baby was born full-term from a spontaneous vaginal delivery in a hospital setting, and that he was healthy at birth and discharged home shortly after. She tells you they have had many visitors, and she thinks that a cousin, who visited the infant right after delivery, might have had a facial rash.
- A quick examination of the boy's skin reveals a group of vesicles on his forehead.
- What skin condition are you most worried it could be? For an afebrile, well-appearing neonate with a vesicular skin lesion, what diagnostic tests and treatment are necessary?

CASE 2

A 4-week-old girl is brought in by her mother for a worsening rash...

- The mother tells you the girl is her third baby who was born vaginally after induction at 36 weeks due to maternal hypertension. The infant spent 1 week in the neonatal intensive care unit for respiratory distress before being discharged.
- The mother says she is concerned because her newborn has had a rash that seems to be spreading. The rash started a week ago and was initially on the chest and now involves parts of the face, back, arms, and upper legs. It does not involve the diaper area. She says she is breastfeeding with some formula supplementation, which she started a couple of weeks ago.
- On examination, the infant's vital signs are within normal limits, and the baby appears very well but has ill-defined xerotic plaques, most notable on the extensor arms and legs, cheeks, and trunk.
- What is the most probable cause of this rash? What advice would you provide this mother?

CASE 3

A 4-week-old boy was referred to the emergency department by his primary care doctor for evaluation of a rash...

- The rash was noted this morning at the boy's 1-month well-child check. The mother states the rash had been present for the last 1 to 2 days and has been rapidly spreading. The infant was born full-term without any complications and had been doing well until the skin changes were noted. No fevers were documented; however, the mother notes that he has been fussier and feeding less than usual.
- On examination, the infant's vital signs are remarkable for an elevated temperature to 37.9°C and a heart rate of 177 beats/min. He is crying, appears uncomfortable, and is difficult to console. Examination of the skin reveals diffuse erythema with accentuation in the neck and axillae. You also make note of some crusting around the eyes and mouth, and focal areas of desquamation on the neck, in addition to noticing a few new developing areas in the skin folds around the diaper area.
- What diagnosis are you most concerned about? What are some options for treatment?

CASE 4

A 3-week-old girl with no significant medical history presents with a rash in her diaper area...

- The mother states the area has become very red and raw and has been worsening over the past 7 days. The baby cries unconsolably whenever she urinates or has a bowel movement. The mother is applying nystatin cream, without any improvement.
- On examination, the infant's vital signs are within normal range. She is fussy but consolable. You notice a small infantile hemangioma on the chest, which the mother states has been there since 1 week of age and has gotten slightly more red. When examining the infant's diaper area, you note diffuse erythema of the area extending over her labia majora and over her buttocks. In the center of her left buttock, you notice an annular ulceration about the size of a quarter, with a small amount of bleeding. The mother tells you she did not notice the bleeding beforehand.
- What is the most likely diagnosis and how would you approach initial management?

Introduction

Neonates often present to the emergency department (ED) with rashes, and most are benign and self-limited, but some—if misdiagnosed—can increase morbidity and mortality by missing underlying systemic disease. Promptly recognizing serious conditions allows clinicians to initiate further evaluation and treatment, improving outcomes.[1]

This issue of *Pediatric Emergency Medicine Practice* reviews 4 common categories of neonatal skin conditions that include diagnoses with the potential for serious outcomes. These categories include: (1) vesicles, pustules, and bullae; (2) erythroderma with or without desquamation; (3) eczematous rashes; and (4) diaper dermatitis.[2,3] This issue reviews strategies for evaluation of skin conditions within these categories and offers guidance for differentiating benign findings from those that should raise concern and lead to further evaluation and management.

Critical Appraisal of the Literature

A literature review was conducted using PubMed, and the following search terms were used: *neonatal rash*, *dermatology*, and *emergency medicine*. Neonatal skin conditions are often benign, but the differential diagnosis is extensive. The topic of neonatal rashes spans many medical specialties, including newborn nursery, neonatology, dermatology, general pediatrics, pediatric rheumatology, pediatric emergency medicine, family medicine, infectious diseases, and general emergency medicine. Approximately 2500 articles can be found in the literature on various newborn rashes and skin conditions in emergency medicine. This issue focuses on neonatal skin complaints that may present to the ED and require additional evaluation and treatment, when indicated. The majority of literature related to pediatric skin emergencies includes case reports and retrospective cohort studies. Several recent publications that review approaches to evaluation, diagnosis, and/or management of select neonatal rashes are highlighted.

Etiology and Pathophysiology

The integumentary system is composed of the epidermis, dermis, hypodermis, nails, hair, and associated glands. This system begins to develop within the first 3 weeks after fertilization, and the cells that develop into skin are multipotent and also give rise to the central nervous system. The skin remains the primary defense mechanism, functioning as a layer of protection enveloping the muscles, bones, and organs within the body. The integumentary system is vital for immune cells, vitamin D synthesis, and temperature regulation. Severe dysregulation of or pathology within this system can disrupt a critical defense mechanism against pathogens in the outside world, with potential catastrophic consequences.[4] For these reasons, it is essential to identify neonatal skin pathology to prevent morbidity and mortality in this vulnerable, high-risk population.

Differential Diagnosis

Skin conditions in the neonatal population can be indicators of severe invasive infection, dietary deficiency, or congenital rheumatologic disorders, all of which can have serious consequences. Several important skin conditions can be separated into broad categories including (1) vesicles, pustules, and bullae; (2) erythroderma with or without desquamation; (3) eczematous rashes; and (4) diaper dermatitis. **(See Table 1.)** When considering a rash in a neonate, the clinician should categorize the rash and further delineate a differential diagnosis within each of these categories. This approach helps to determine whether the presentation and physical examination have features of high-risk rashes.[1,3]

Neonatal skin findings may be signs of infection including herpes simplex virus (HSV), syphilis, vari-

Table 1. Differential Diagnosis, by Category of Skin Condition[2,3,5,6]

Type of Rash	Infectious	Benign	Other
Vesicles, pustules, and bullae	• Herpes simplex virus • Varicella • Scabies • Gram-positive *Staphylococcus*/*Streptococcus* pustulosis • Bullous impetigo • Congenital candidiasis	• Cephalic pustulosis • Transient pustular melanosis of the newborn • Erythema toxicum neonatorum • Miliaria crystallina • Miliaria rubra • Contact dermatitis • Traumatic (sucking or rubbing blister)	• Epidermolysis bullosa • Epidermolytic ichthyosis • Incontinentia pigmenti
Erythroderma with of without desquamation	• Staphylococcal scalded skin syndrome • Toxin-mediated erythema • Syphilis (congenital)	• Normal physiological peeling	• Congenital ichthyosis
Eczematous rashes	• Superinfected atopic dermatitis • Eczema herpeticum	• Atopic dermatitis • Seborrheic dermatitis	• Neonatal lupus erythematosus • Severe nutritional deficiencies • Failure to thrive
Diaper dermatitis	• Candidal diaper rash • *Staphylococcus*/*Streptococcus* pustulosis • Impetigo	• Irritant contact dermatitis	• Langerhans cell histiocytosis • Infantile hemangiomas • Acrodermatitis enteropathica (zinc deficiency)

cella, fungal infections, staphylococcal scalded skin syndrome (SSSS), or staphylococcus/streptococcus toxic shock, all of which have a significant morbidity and mortality.[1] The ability to differentiate characteristics of these high-risk skin conditions from more common benign neonatal rashes such as neonatal acne, erythema toxicum neonatorum, candida dermatitis, infantile acropustulosis, eczema, atopic dermatitis, or seborrheic dermatitis can be life-saving.[2]

Emergency Department Evaluation

Referral to an Emergency Department for Neonatal Skin Rashes

Neonatal rashes may have had little to no prehospital care, and patients who are referred to the ED may have never had an in-person evaluation with an outpatient clinician prior to their presentation to the ED. Parents of some neonates may have received medical advice via telemedicine prior to ED presentation, and it is not uncommon for a parent to have uploaded digital photos requesting medical advice and/or to have a telehealth visit with resultant recommendation for evaluation in the ED if there are any concerning features. Effective communication with a referring physician can be useful to narrow/tailor the differential diagnosis and to assure needed follow-up to assess evolution of skin findings and confirm the working diagnosis. When a family perceives a potentially serious rash as benign, it can be helpful to partner with the primary care clinician for discussions around the recommended testing and management.

Initial Stabilization

As with any patient encounter, first start by reviewing the patient's vital signs and confirming stability of their airway, breathing, and circulation (ABCs). Once the patient is deemed clinically stable, continue with the complete evaluation.

History

It is essential to obtain a comprehensive birth history, as well as a detailed maternal history. Important components include history of maternal infection, including HSV, syphilis (rapid plasma reagin), and Group B *Streptococcus* (GBS) status at birth (in addition to GBS treatment); maternal chronic and acute medical conditions; maternal medications taken before and/or throughout pregnancy; delivery methods; delivery location (home vs hospital); prenatal care; birth weight; gestational age at birth; and whether the infant required care in the neonatal intensive care unit (NICU) following birth.[5,7,8]

When evaluating neonatal rashes, the developmental history from birth up until the time of presentation to the ED is also important. Ask for any history of skin fragility at/after birth associated with pressure, friction, or from adhesive application. It is important to understand the timeline of development of the skin findings, including onset of skin findings/congenital nature of skin findings, evanescent nature, evolution over time, and presence of associated symptoms of discomfort, such as pain or pruritus. Additional questions to ask include whether the infant is gaining appropriate weight (a newborn can lose up to 10% of birth weight up to 2 weeks post birth), what the infant is eating (breast milk, formula, other), the amount the newborn is feeding, and the frequency of urination and stooling. Establish whether the caregiver or primary care clinician have any concerns about weight or development.[9] Finally, determining whether the patient currently has or has had fever (defined as a rectal temperature of ≥38°C) can change the evaluation and management of a neonate with a rash.[10]

A thorough family history is also pertinent when evaluating a neonate with a rash. Relevant information includes a family history of skin infections, including HSV or methicillin-resistant *Staphylococcus aureus* (MRSA) infections in parents, siblings, or other close contacts. Although often overlooked, it is essential to identify sick contacts within the family or those in close contact with the infant, specifically whether the newborn has come into contact with people who have had skin lesions, including cold sores on or in the mouth, fever, and/or viral symptoms. A family history of skin conditions should be noted, including atopy (atopic dermatitis/eczema, asthma, food allergies, environmental allergies); seborrheic dermatitis; psoriasis; blistering; skin thickening, particularly on the hands and feet; or nail changes.

Neonates with congenital ichthyoses may present with varying degrees of skin thickening, desquamation, and erythema. This clinically and genetically heterogeneous group of disorders may present at birth with a collodion membrane, skin that is tight and shiny (like cellophane), which may be accompanied by eclabium and ectropion. This membrane sheds in the subsequent weeks, with resultant development of the patient's skin phenotype. This heterogeneous group of disorders may also present with blistering and skin fragility in the newborn period in patients with epidermolytic ichthyosis.[11]

Physical Examination

Photos in the patient's medical record documenting skin findings can be helpful, not only for acute ED presentations, but also for consulting services, to evaluate and to check progression of the condition.

When evaluating a rash, a complete physical examination is essential. The infant must be fully exposed and have all clothing removed, including the diaper. A full skin examination requires careful examination of the hair, face, trunk, skin folds (neck, axilla, inguinal areas, gluteal folds), fingers, toes, nails and nail beds, and diaper area. Evaluation of mucosal surfaces during a general and skin examination

should also be performed. The presence of skin findings in certain areas such as acral (palms and soles) or intertriginous areas may help to develop and solidify a differential diagnosis.

A detailed and precise description of pertinent skin findings is essential for diagnosis. Using clear, descriptive terminology of the primary morphology (macular, papular, vesicular, nodular), as well as defining color (eg, erythematous), configuration (eg, annular), and distribution (eg, localized, generalized, acral, intertriginous) can help with the overall diagnosis and determine the level of concern. **(See Appendix 1, page 24.)** Palpation can be exceptionally helpful in defining skin characteristics, including primary and secondary characteristics (raised vs flat, smooth vs rough), tenderness, blanchability (blanchable erythema vs nonblanchable petechiae and purpura), location in skin (dermal vs subcutaneous), firmness (soft vs hard), compressibility (compressible vs noncompressible), and mobility (mobile vs fixed).

Once the physical examination is complete, assess whether the skin findings fall into the categories of discussion, which include (1) vesicles, pustules, and bullae; (2) erythroderma with or without desquamation; (3) eczematous rashes; or (4) diaper dermatitis. After the patient's skin findings have been assessed and categorized, a relevant differential diagnosis can be considered and indicated diagnostic studies can be determined.

Diagnostic Studies

The need for diagnostic studies in the neonate with skin findings is often most extensive when an infectious cause for the skin lesion is being considered. However, certain congenital skin conditions also require rapid recognition, evaluation, admission, and urgent dermatology evaluation, if possible. Because diagnostic studies in the ED are driven by clinical concern, the physical findings and stratification into the 4 categories, when relevant, may help to guide the necessary workup.

Importantly, any neonate aged ≤21 days, irrespective of the presence of skin findings, who has a reported or measured temperature of ≥38°C, needs a complete infectious workup, which is defined as blood testing, urine testing, and cerebrospinal fluid testing. Infants aged 22 to 60 days will need additional testing as well, though potentially less extensive. This recommendation is driven by the American Academy of Pediatrics (AAP) "Clinical Practice Guideline: Evaluation and Management of Well-Appearing Febrile Infants 8 to 60 Days Old,"[10] available at: https://doi.org/10.1542/peds.2021-052228

Presenting Features and Management, Based on Skin Findings

General Management

Neonates with temperature of ≥38.0°C should be treated according to the AAP infant fever guidelines,[10] and the addition of acyclovir should be considered for any infant with a rash or concern for HSV exposure. Treatment can be tailored after the workup has been completed and the cause of the underlying fever and/or rash has been identified.

Vesicles, Pustules, and Bullae

The presence of blisters in a neonate should raise concern for a possible serious underlying infectious condition; however, more-benign skin conditions may also present with vesicles, pustules, or bullae of the skin. Common benign neonatal skin conditions in the newborn period that present with vesicles and pustules include transient pustular melanosis of the newborn, erythema toxicum neonatorum, neonatal cephalic pustulosis, and miliaria. It is important to distinguish the benign skin conditions from more serious neonatal skin conditions. An unwell-appearing or febrile neonate with a blistering rash requires immediate attention and evaluation and management for serious infections, including blood work and antimicrobial therapy to cover multiple potential invasive pathogens. The more concerning skin conditions in this category include HSV and staphylococcal/streptococcal cutaneous infections.

Transient Neonatal Pustular Melanosis

Transient neonatal pustular melanosis is a benign skin condition that is typically present at birth. It is characterized by superficial pustules that rupture easily, leaving behind hyperpigmented macules with a fine collarette of scale. These lesions are most commonly found on the forehead, chin, neck, back, and buttocks. **(See Figure 1, page 7.)** Pustules resolve within the first few days of life, and the residual hyperpigmentation that resembles freckles fades over several weeks. A Wright stain will demonstrate neutrophils: however, these lesions are sterile. No treatment is necessary, and the condition resolves spontaneously.

Erythema Toxicum Neonatorum

Erythema toxicum neonatorum, a common, benign neonatal rash, usually appears within the first 24 to 48 hours after birth. It presents as erythematous macules, papules, and pustules on an erythematous base, often described as having a "flea-bitten" appearance. The rash typically involves the face, trunk, and extremities, sparing the palms and soles. The lesions are transient, and wax and wane over several days before resolving. No treatment is required. **(See Figure 2, page 7.)**

Neonatal Cephalic Pustulosis

Neonatal cephalic pustulosis, sometimes referred to as "neonatal acne," typically develops around 2 to 3 weeks of age. It presents with skin-colored to erythematous papules and/or pustules, primarily on the forehead, cheeks, chin, and upper trunk. **(See Figure 3.)** Unlike true acne, comedones are absent. The condition is thought to be associated with hormonal changes and colonization with *Malassezia* species. While treatment is often unnecessary, topical antifungals such as ketoconazole may be used for persistent or significant cases. The condition is self-limited and resolves within weeks to months.

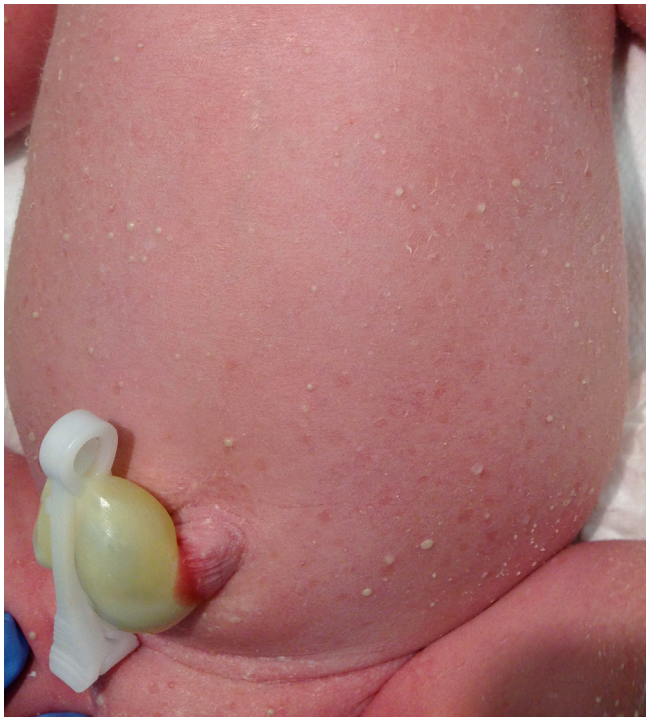
Miliaria Crystallina and Miliaria Rubra

Miliaria crystallina and miliaria rubra can also cause follicularly based superficial vesicles and papulopustules, respectively, which appear different from the other benign rashes discussed previously. **(See Figure 4, page 8.)**

Herpes Simplex Virus Infection

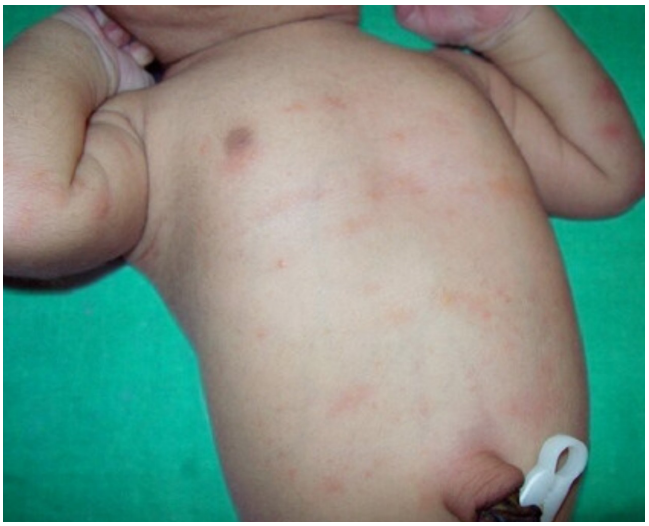
During the neonatal period, one of the most life-threatening conditions that can present with skin findings is a neonatal HSV infection. Approximately 85% of neonatal HSV is acquired peripartum, 10% is acquired postnatally, and 5% is acquired in utero.

Figure 1. Transient Neonatal Pustular Melanosis



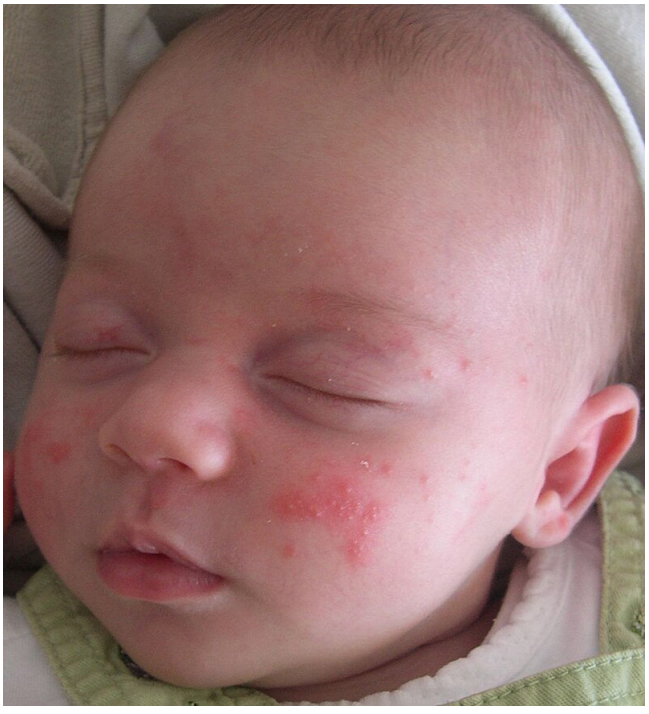
Fragile superficial pustules and hyperpigmented macules with collarettes of scale.
Available at: https://commons.wikimedia.org/wiki/File:Transient_Neonatal_Pustular_Melanosis_3.jpg The image was cropped to show the rash on the infant's stomach.
Author Gzzz - Own work. Used under the Creative Commons Attribution-Share Alike 4.0 International license

Figure 2. Erythema Toxicum Neonatorum



Reprinted from Farhana Tahseen, Taj Sameer Haveri, Arun C. Inamadar. A cross-sectional prospective study of cutaneous lesions in newborn. *International Scholarly Research Notices*. Copyright © 2014 Farhana Tahseen, Taj Sameer Haveri, and Arun C. Inamadar. https://doi.org/10.1155/2014/360590 Used under the Creative Commons Attribution 3.0 Unported License

Figure 3. Neonatal Cephalic Pustulosis



Erythematous papules and pustules on the cheeks of a neonate.
By selbst erstellt (Fragegeist) - selbst erstellt (Fragegeist), This image is in the public domain, https://commons.wikimedia.org/w/index.php?curid=12215255

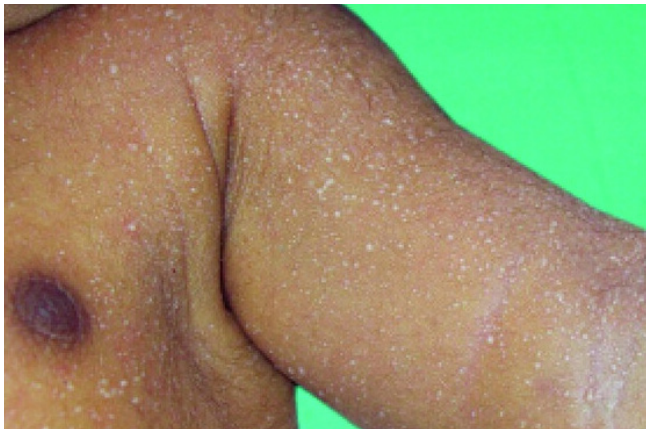
The highest risk patients include neonates born to mothers whose primary infection occurred at the time of delivery, which has a 30% risk for transmission to the newborn. If infected during the peripartum period, the infant usually presents with clinical manifestations around day of life 9 through day of life 11.[13,14]

Neonatal HSV infection presents with grouped vesicles on an erythematous base and may be accompanied by systemic signs such as fever, lethargy, or seizures. Neonatal HSV can be divided into categories including disseminated; central nervous system (CNS); or skin, eye, mouth disease. It is often easiest to identify skin, eye, mouth disease because skin findings can be found in both disseminated and CNS disease. HSV skin lesions usually start as papules, which evolve into vesicles and subsequently erode with an erythematous base and overlying hemorrhagic crusting, usually measuring 1 to 3 mm (approximately 0.12 in) in diameter. **(See Figure 5.)** The lesions often arise initially on presenting parts such as the scalp or gluteal region. Although rare, neonates can be inoculated by HSV via a fetal scalp probe during delivery or exposure in the birth canal.[15-17]

For patients with neonatal HSV, high suspicion and prompt diagnosis and treatment can be lifesaving. Concern can include family history or potential exposures, as well as clinician experience. The presence of any vesicles, grouped lesions, punched-out lesions, or concern for HSV should warrant an evaluation in a well-appearing full-term neonate.[14,18] A 2024 retrospective study suggested that in full-term afebrile infants aged ≤60 days, the risk for life-threatening infection is low once HSV infection has been ruled out.[19] However, in preterm infants with pustules and/or vesicles or patients with fever, an elevated level of suspicion should be maintained, and a comprehensive infectious evaluation is advised.

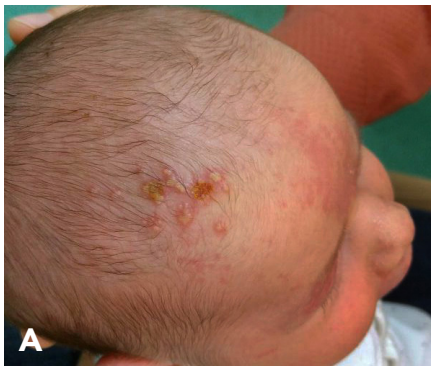
HSV testing is recommended for all infants presenting with vesicles, clustered pustules, and/or punched-out erosions. HSV polymerase chain reaction (PCR) (or culture if PCR is not available) from skin lesion(s) should be sent along with blood work including serum HSV PCR, liver function tests, and coagulation studies. As part of the neonatal HSV evaluation, HSV cultures and/or PCR should also be sent from the mouth, conjunctiva, nasopharynx, and rectum. If the patient is stable, a lumbar puncture should be performed to evaluate for HSV encephalitis, but this should not delay prompt treatment with parenteral acyclovir. Current recommendations are that a lumbar puncture should be performed for any neonate with

Figure 4. Miliaria Crystallina

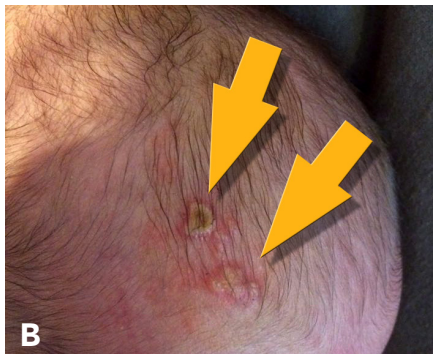


Fragile superficial follicularly based vesicles.
Reprinted from Farhana Tahseen, Taj Sameer Haveri, Arun C. Inamadar. A cross-sectional prospective study of cutaneous lesions in newborn. *International Scholarly Research Notices*. Copyright © 2014 Farhana Tahseen, Taj Sameer Haveri, and Arun C. Inamadar. https://doi.org/10.1155/2014/360590 Used under the Creative Commons Attribution 3.0 Unported License

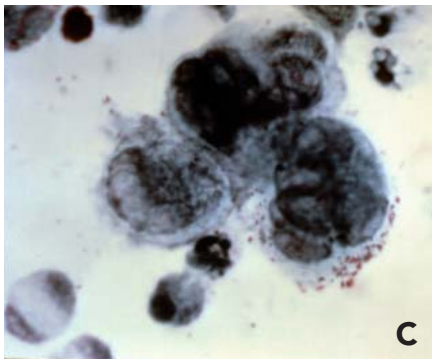
Figure 5. Neonatal Herpes Simplex Virus Infection



View A. Grouped vesicles on an erythematous base on the head of a neonate. By Kapitainekavern - Own work. https://commons.wikimedia.org/w/index.php?curid=66206535 Used under the Creative Commons Attribution-Share Alike 4.0 International license



View B. Grouped vesicles on an erythematous base on the head of a neonate. By Kapitainekavern - Own work. https://commons.wikimedia.org/w/index.php?curid=66206536 Used under the Creative Commons Attribution-Share Alike 4.0 International license



View C. Tzanck smear from the base of a vesicle, showing a multinucleated giant cell. https://commons.wikimedia.org/wiki/File:Tzanck_test.png This image is in the public domain.

a rash that is clinically concerning for HSV, even in the absence of fever.[13-16]

If left untreated, ocular HSV can lead to scarring, vision impairment, and blindness. Untreated disseminated HSV leads to fulminant sepsis, coagulopathy, and death. Duration of treatment depends on the suspicion for invasive versus cutaneous infection. In general, treatment with parenteral acyclovir should be initiated immediately for any neonate with vesicular skin lesions for which HSV is being considered.

Other Serious Conditions

Congenital candidiasis may present at birth with diffuse erythema and pustules with potential involvement of the palms, soles, and nails, and requires antifungal treatment. Congenital candidiasis can be dangerous to the neonate, in contrast to the common candidal diaper rash, which is easily diagnosed and managed. Bacterial infections, such as those caused by *S aureus*, can present with pustules, bullae, or cellulitis, requiring antibiotic therapy. Incontinentia pigmenti is a genetic condition that presents in the neonatal period with blaschkolinear vesicles. **(See Figure 6.)** It may have overlapping features with infectious etiologies, such as HSV. Other concerning conditions include Langerhans cell histiocytosis, which may mimic seborrheic dermatitis in the diaper and intertriginous areas, and scabies, which causes significant itching and may have pustules in characteristic locations such as acral areas and skin folds.

For all blistering skin lesions with vesicles and/or pustules, cultures and PCR testing of the lesion (bacterial and viral) should be collected, as indicated for the suspected differential diagnosis based on the clinical presentation and morphology. Specimens should be collected from the blister/pustule fluid (for Gram stain and bacterial culture), blister roof for fungal infections, and from the base of the lesion (for viral testing). A 2024 publication in *Pediatrics* provides a proposed approach to the evaluation and management of afebrile, well-appearing, term neonates presenting with vesicles and pustules.[19]

Erythroderma With or Without Desquamation

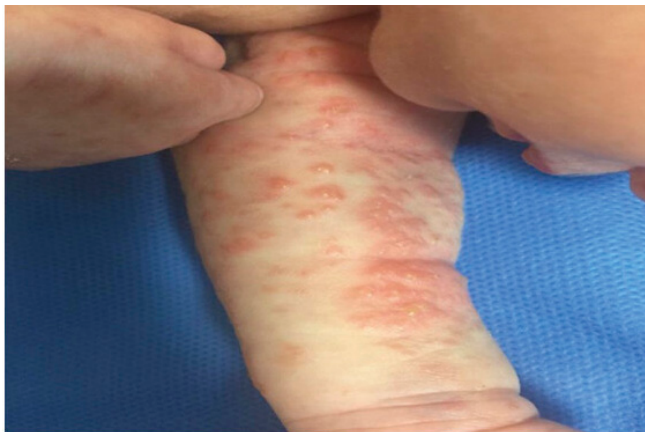
Normal physiologic peeling in a neonate is common. It is most prominently noted in neonates who are born after their due date, and it does not require specific treatment. Reassurance can be provided along with supportive measures such as using bland emollients. While desquamation in the neonate may represent benign physiologic peeling, the more serious causes of this type of rash in the neonatal period must not be overlooked. The presence of erythroderma combined with desquamation may indicate a localized infection or a severe infectious process, such as SSSS or toxin-mediated erythema from *S aureus* or *Streptococcus pyogenes* infection.[6]

Staphylococcal Scalded Skin Syndrome

SSSS should be considered in the presence of irritability, skin erythema, skin tenderness, blister formation, or desquamation. **(See Figure 7, page 10.)** SSSS has a predilection for intertriginous areas. Since patients with SSSS may also present with fever, an age-appropriate fever workup should be carried out when appropriate. Seborrheic dermatitis can present similarly with accentuation in skin folds; however, this has a gradual onset in a well-appearing child.

The diagnosis of SSSS is made clinically and can be supported by identifying the toxin-producing strain of bacteria associated with the cutaneous findings. Patients often present with irritability due to skin tenderness. There may be accompanied fever. Skin findings may include periorbital and perioral erythema, with radial crusting and/or erosion. In addition, generalized erythema accentuated in the skin folds (neck, axilla, diaper area) is noted. Skin findings are typically reported to have developed over hours to days. Notably, the presence of skin bullae or crusting shares features that overlap with conditions in the "vesicles, pustules, and bullae" category. *S aureus* releases an exfoliating toxin, and the resulting skin erythema, desquamation, and associated superficial blister formation are due to toxin cleavage of the epidermis at the level of the stratum corneum. An important consideration for SSSS is that the site of inoculation may be distant from the sites of skin involvement and includes sites such as the nasopharynx or umbilicus. When cultured, negative lesional cultures do not rule out SSSS, as toxin-mediated blisters in this condition are sterile.[19-22]

Figure 6. Incontinentia Pigmenti



Vesicular lesions in a blaschkolinear arrangement.

Historically, clindamycin has been added to the treatment regimen for SSSS because of the theoretical benefit of decreasing ribosomal production of staphylococcal endotoxin. However recent studies have not supported a clinical benefit. SSSS should be treated early with penicillinase-resistant penicillins, such as nafcillin or oxacillin; alternatives include a first- or second-generation cephalosporin. If there is a concern for MRSA, vancomycin should be used instead.[19-26]

Congenital Syphilis

An uncommon but concerning cause of peeling skin in the neonate is congenital syphilis **(see Figure 8, page 11)**, although this is not typically an isolated finding. While rare, it is important to consider congenital syphilis, given the 10-fold increase in syphilis cases between 2012 and 2022.[27] Mothers who receive prenatal care are screened in their second trimester of pregnancy, and prenatal history and laboratory studies should be obtained. Infants with congenital syphilis are often ill-appearing, have associated hepatosplenomegaly, blood-stained rhinitis, and lymphadenopathy, as well as possible hemolytic anemia and thrombocytopenia.

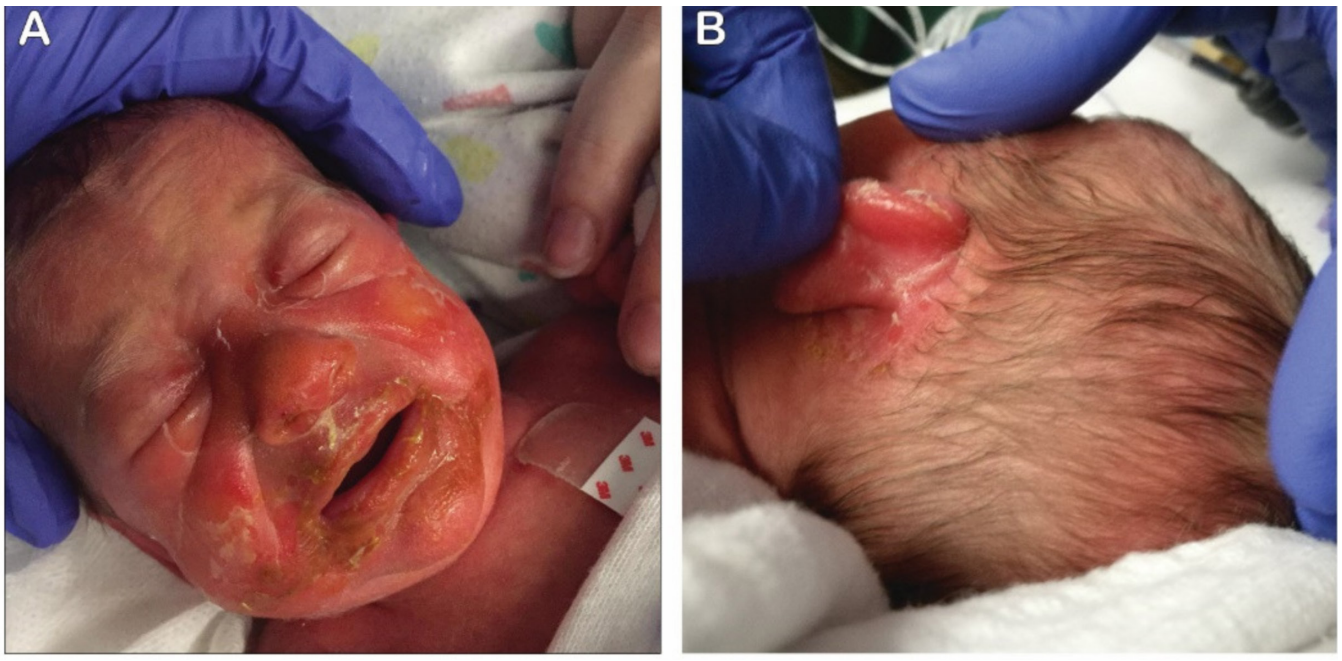
The diagnosis of congenital syphilis can be confirmed with serum quantitative nontreponemal serologic titer that is ≥4-fold higher than the birth parent's titer at delivery; a positive darkfield test; a positive PCR of the placenta, cord, lesions, or body fluids; or a positive silver stain of the placenta or cord. If testing is not available in a timely matter and clinical suspicion is high, treatment should be initiated.[8]

Neonates with signs or symptoms consistent with congenital syphilis should be admitted to the hospital for a full evaluation and treatment. Management includes a 10-day course of intravenous aqueous crystalline penicillin G. Hospital admission allows for close monitoring and completion of the full treatment course, as well as further evaluation including cerebrospinal fluid analysis, long bone x-rays, and neuroimaging, if indicated. Ongoing follow-up is essential to monitor for late manifestations, such as hearing loss or dental abnormalities, and to ensure resolution of laboratory abnormalities. Infants with congenital syphilis are at risk for long-term complications including sensorineural hearing loss, dental abnormalities (Hutchinson teeth), developmental delays, and skeletal deformities. Regular follow-up with pediatric infectious disease, audiology, and developmental specialists is essential to monitor these sequelae.[8,24]

Eczematous Rashes

Many eczematous eruptions presenting in the infantile period are benign in nature; however, occasionally, these eruptions are associated with a more serious underlying condition. Diffuse, scaly, pruritic patches and plaques may represent atopic dermatitis, which approaches 15% to 20% incidence in this age group.[28] Salmon-colored patches with greasy scale may be features of seborrheic dermatitis.

Figure 7. Staphylococcal Scalded Skin Syndrome in a Neonate

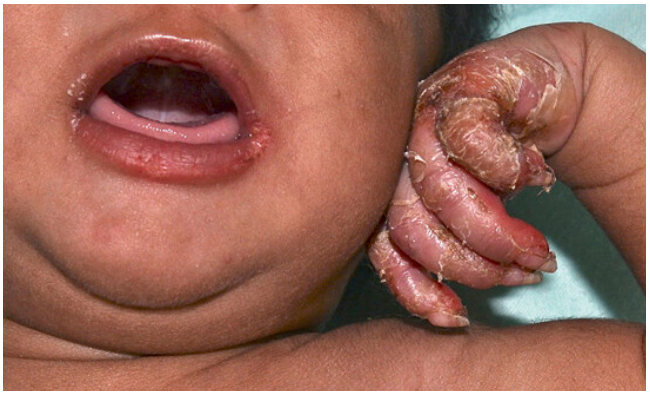


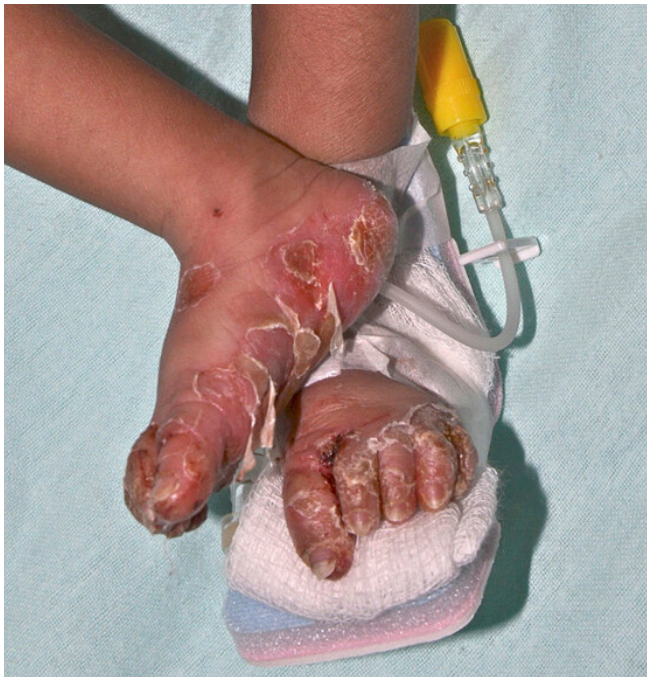
View A. Erythema with periorbital, perinasal, and perioral accentuation and desquamation.
View B. Erythema and desquamation involving the posterior auricular area (skin fold).
Reprinted from Charlotte M. Nusman, Charlotte Blokhuis, Dasja Pajkrt, et al. *Antibiotics (Basel)*. 2022;12(1):38. © 2022 by the authors. https://doi.org/10.3390/antibiotics12010038 Used under the Creative Commons Attribution 4.0 International license

Neonatal Lupus Erythematosus

Neonatal lupus erythematosus may manifest with a facial rash that can characteristically involve the periorbital region. **(See Figure 9A.)** If erythematous patches are noted to be on the forehead or around the eyes, these plaques may worsen with exposure to sun.[29,30] Additionally, neonatal lupus erythematosus can present with annular lesions that mimic a tinea infection or impetigo. **(See Figure 9B.)** Approximately 65% of patients with neonatal lupus erythematosus will have cutaneous findings prior to 1 month of life. These patients should have a complete evaluation. Most importantly, these patients have a 2% risk for

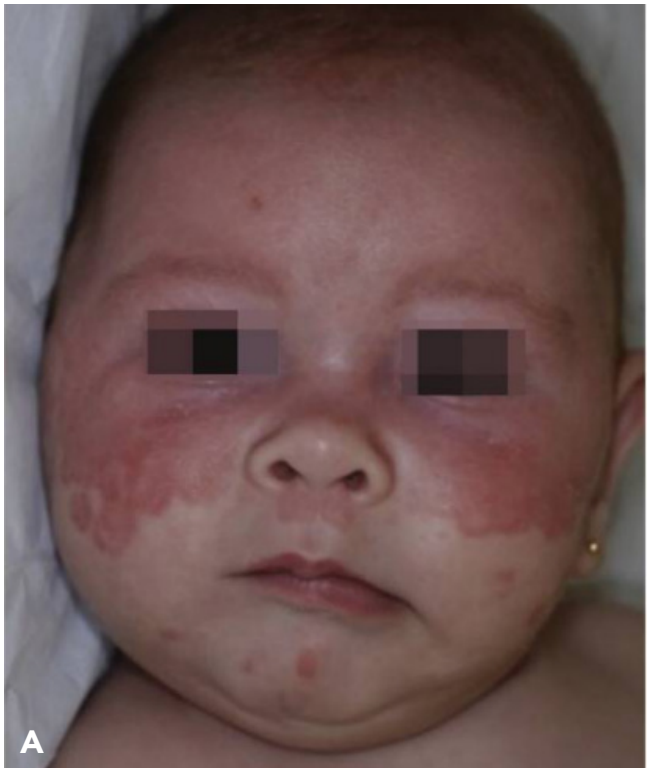
Figure 8. Desquamation of the Hand and Feet of a Neonate With Congenital Syphilis

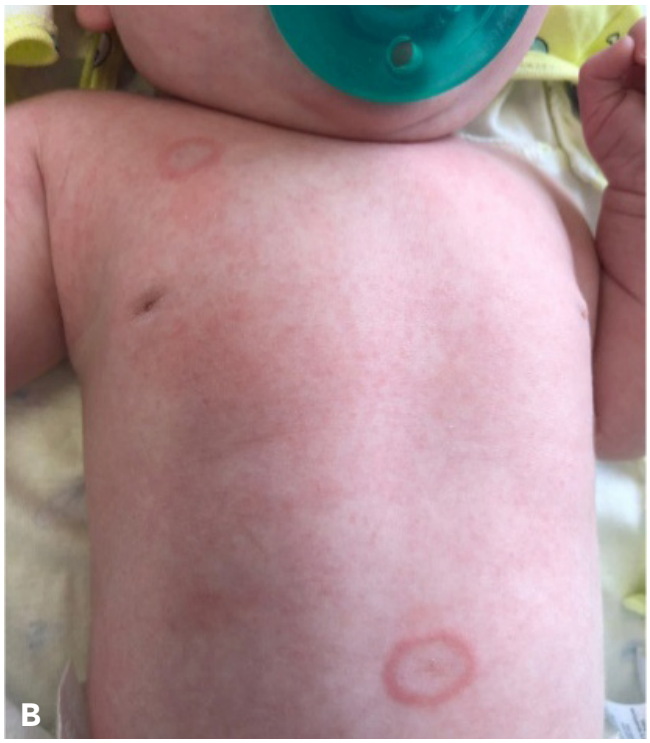




Palmoplantar erythema and desquamation.
Reprinted from Alexander K. C. Leung, Kin Fon Leong, Joseph M. Lam. A case of congenital syphilis presenting with unusual skin eruptions. *Case Reports in Pediatrics*. 2018;2018:1761454. Copyright © 2018 Alexander K. C. Leung et al. https://doi.org/10.1155/2018/1761454 Used under the Creative Commons Attribution 4.0 International license

Figure 9. Cutaneous Findings in Neonatal Lupus Erythematosus





View A. Periorbital erythema.
View B. Annular lesions in neonatal lupus erythematosus.
Reprinted from Everton Carlos Siviero do Vale, Lucas Campos Garcia. Cutaneous lupus erythematosus: a review of enteropathogenic, clinical, diagnostic, and therapeutic aspects. *Anais Brasileiros de Dermatologia*. 2023;98(3):355-372. © 2023 Sociedade Brasileira de Dermatologia. https://doi.org/10.1016/j.abd.2022.09.005 Used under the Creative Commons Attribution 4.0 International license

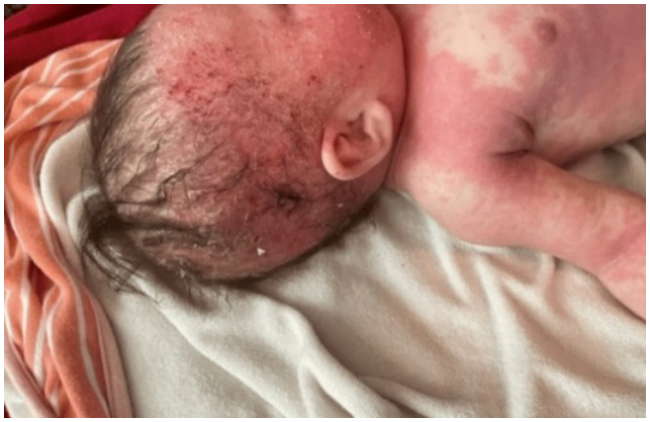
life-threatening heart block, and an electrocardiogram should be performed. In addition, if there is a high clinical suspicion for systemic lupus erythematosus, pediatric rheumatology should be involved early on to help guide evaluation and management. When considering neonatal systemic lupus erythematosus, it is important to obtain serologies including Ro and La antibodies, liver function tests, and coagulation studies, as well as measurement of head circumference (due to the association with hydrocephalus).[29,30]

Atopic Dermatitis

Infantile atopic dermatitis may present diffusely. **(See Figure 10.)** Characteristic areas of involvement include the cheeks, with sparing of the nasal/perinasal area "lightbulb sign." **(See Figure 11A.)** Diffuse, poorly marginated xerotic/scaly papules and plaques may be noted on the trunk and on extensor surfaces. **(See Figure 11B and 11C.)** The diaper area is often spared. Pruritus is a notable feature, although this may be difficult to assess in the neonatal period.

Atopic dermatitis in the neonate is a diagnosis of exclusion once more-concerning diagnoses have been excluded. Treatment of atopic dermatitis in the neonate begins with dry skin care recommendations such as multiple applications per day of an unscented, bland emollient and may involve use of a low-potency corticosteroid, with escalation as needed. It is recommended that clinicians choose topical corticosteroids based on availability both in the hospital and as covered by local insurance carriers.[31-32] **(See Table 2, page 13.)**

Figure 10. Diffuse Infantile Atopic Dermatitis



Diffuse erythematous xerotic plaques with focal erosions.
Reprinted from Nehaa Sohail, Ayaan Sohail, Wasiq Nadeem, et al. Itchy and swollen: atopic dermatitis with cephalocervical lymphadenitis in an infant. *Cureus*. 2024;16(9):e68723. © Copyright 2024 Sohail et al. https://doi.org/10.7759/cureus.68723 Used under the Creative Commons Attribution 4.0 International license

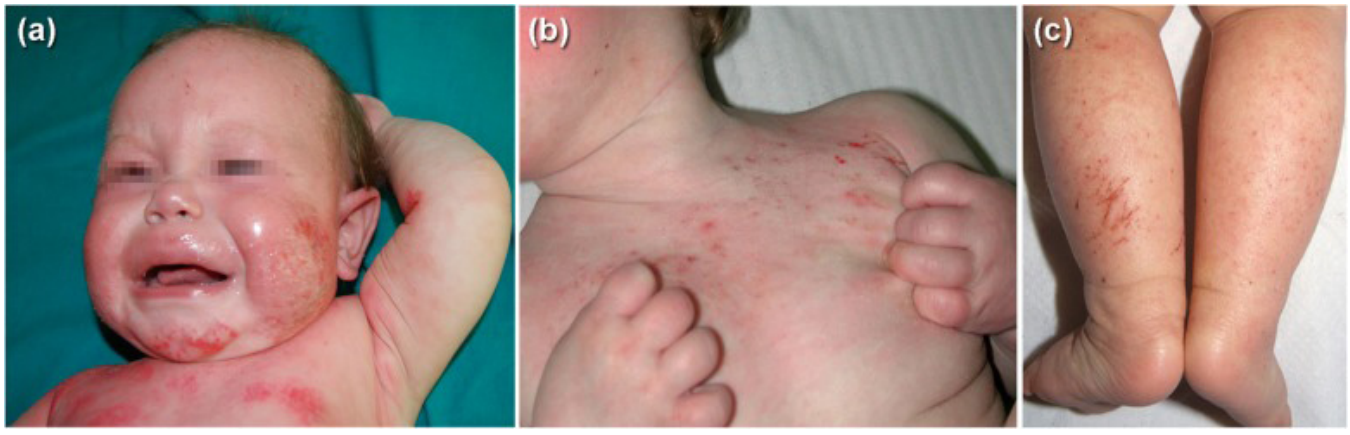
Superinfection

Assessment for signs of superinfection that warrant antimicrobial therapy (eg, *Staphylococcus*, *Streptococcus*, or HSV) should be performed. It is important to evaluate the individual primary and secondary lesions when assessing for the possibility of superinfection. HSV superinfection (including eczema herpeticum) is marked by the presence of grouped vesicles and/or hemorrhagic, scalloped erosions. **(See Figure 12 and Figure 13, page 13.)**

Diaper Dermatitis

Most diaper rashes are the result of irritant contact dermatitis due to the acidic nature of urine and stool, or from the diaper itself, and are typically most prominent in areas of skin in contact with the diaper. Contact dermatitis is often treated with barrier creams

Figure 11. Infantile Atopic Dermatitis



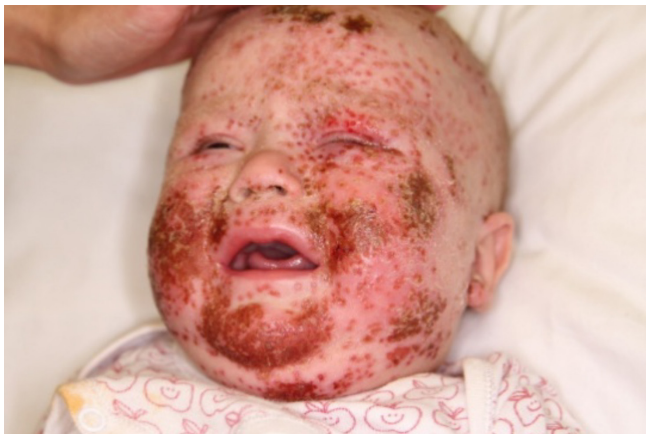
Diffuse poorly marginated plaques with linear erosions. Note sparing of the nasal area.
Reprinted from May El Hachem, Giuseppe Di Mauro, Roberta Rotunno, et al. Pruritus in pediatric patients with atopic dermatitis: a multidisciplinary approach - summary document from an Italian expert group. *Italian Journal of Pediatrics*. 2020;46(1):11. © The Author(s). https://doi.org/10.1186/s13052-020-0777-9 Used under the Creative Commons Attribution 4.0 International license

such as zinc oxide and/or petroleum jelly-based emollients. If there is concern for bacterial or fungal infection, skin cultures should be collected to evaluate for *Staphylococcus*/*Streptococcus* or a fungal etiology.

Candidal Infections

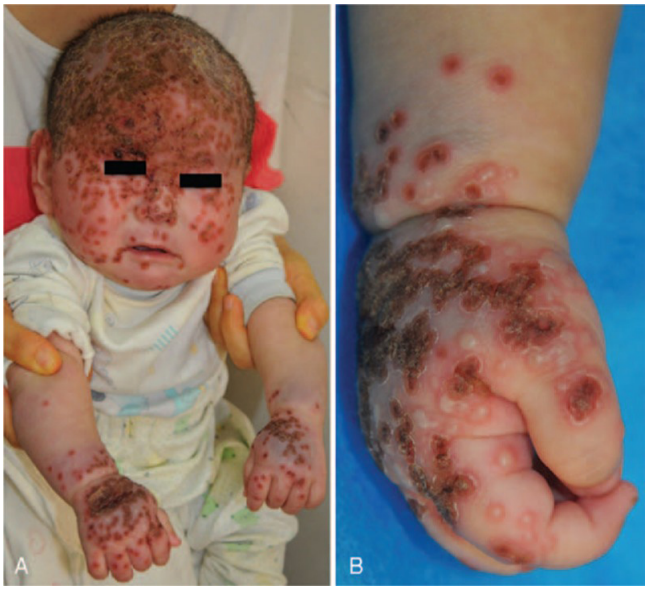
Candidal infections should be considered if the rash appears fleshy red with surrounding, satellite lesions. In contrast to a contact diaper dermatitis, candidal diaper rash involves the skin folds.[1] **(See Figure 14 and Figure 15, page 14.)** When a strong clinical suspicion exists for candidal diaper dermatitis, topical antifungal therapy should be initiated. A first-line agent is often nystatin, which should be applied with every diaper change. After 1 to 3 days, if there is no improvement, an azole, such as clotrimazole, miconazole, or ketoconazole, should be started instead. With any diaper rash, frequent diaper changes to avoid prolonged skin contact with urine or feces will promote healing.[33]

Figure 12. Eczema Herpeticum With Eye Involvement



Hemorrhagic punched erosions with periocular involvement.
Reprinted from Katarzyna Karpierz, Ernest P. Kuchar. An infant with seborrhoeic dermatitis and eczema herpeticum complicated by a generalized infection. *Cureus*. 2021;13(8):e16818. © Copyright 2021 Karpierz et al. https://doi.org/10.7759/cureus.16818 Used under the Creative Commons Attribution 4.0 International license

Figure 13. Eczema Herpeticum



Punched-out hemorrhagic erosions, some intact vesicles and pustules in a patient with eczema herpeticum. Note the serpiginous arrangement of the erosions.
Reprinted from Kaiwen Zhuang, Qiong Wu, Xin Ran, et al. Oral treatment with valacyclovir for HSV-2-associated eczema herpeticum in a 9-month-old infant: a case report. *Medicine (Baltimore)*. 2016;95(29):e4284. Copyright © 2016 The Authors. https://doi.org/10.1097/MD.0000000000004284 Used under the Creative Commons Attribution-No Derivatives 4.0 International License

Table 2. Sample Topical Corticosteroid Potency Chart[31,32]

Class	Drug	Formulation	Strength (%)
I. Very high potency	Augmented betamethasone dipropionate Clobetasol propionate	Ointment Cream, foam, ointment	0.05 0.05
II. High potency	Augmented betamethasone dipropionate Betamethasone dipropionate Fluocinonide	Cream, lotion Ointment Cream, gel, ointment	0.05 0.05 0.05
III. Medium to high potency	Betamethasone dipropionate Triamcinolone acetonide	Cream Cream, ointment	0.05, 0.1 0.5
IV-V. Medium potency	Betamethasone valerate Fluocinolone acetonide Fluticasone propionate Hydrocortisone butyrate Hydrocortisone valerate Triamcinolone acetonide	Cream, lotion Cream, ointment Cream Ointment Cream, ointment Cream, lotion, ointment	0.1 0.025 0.05 0.1 0.2 0.025-0.1
VI. Low potency	Alclometasone dipropionate Desonide Fluocinolone Hydrocortisone butyrate	Cream, ointment Cream, gel, foam, ointment Cream Cream	0.05 0.05 0.01 0.1
VII. Lowest potency	Hydrocortisone	Cream, lotion, ointment	1-2.5

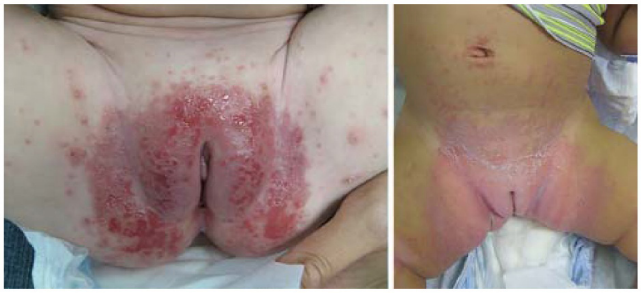
Seborrheic Dermatitis

Seborrheic dermatitis may present with erythematous patches and plaques that favor the intertriginous areas such as the neck, but can also be present in the diaper area. **(See Figure 16 and Figure 17.)** Seborrheic dermatitis is also called "napkin psoriasis" in the diaper area and is manifested by well-demarcated erythematous plaques.

Infantile Hemangiomas

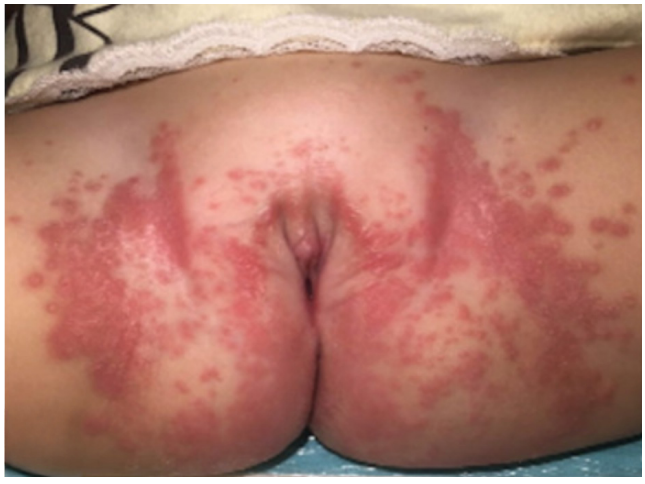
Infantile hemangiomas can be particularly problematic when located in the diaper area. Infantile hemangiomas often proliferate during the first few weeks of life. A hemangioma precursor may begin as a well-demarcated pink or red patch with visible telangiectasias that, over time, develop red macules that coalesce, along with subsequent skin thickening. **(See Figure 18, page 15.)** In the diaper area, a hemangioma precursor may additionally present as

Figure 14. Candidal Diaper Dermatitis



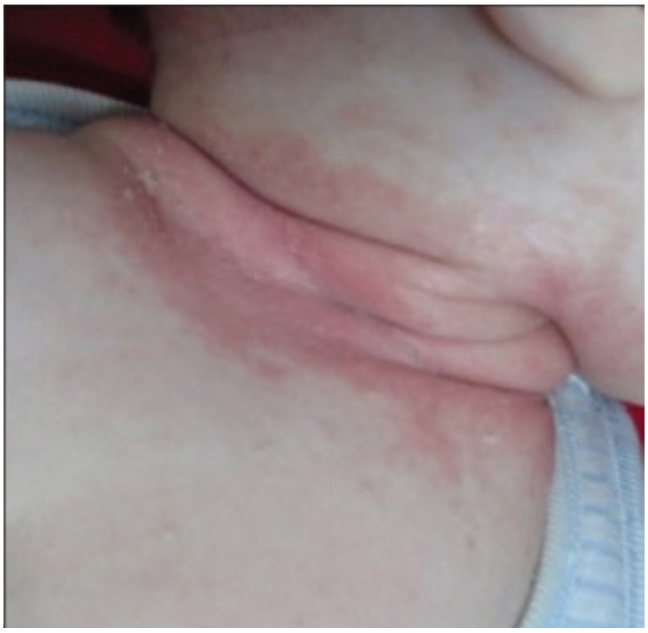
Beefy red plaques with satellite lesions.
Reprinted from Elaine C. Siegfried, Adelaide A. Hebert. Diagnosis of atopic dermatitis: mimics, overlaps, and complications. *Journal of Clinical Medicine*. 2015;4(5):884-917. © 2015 by the authors. https://doi.org/10.3390/jcm4050884 Licensed under the Creative Commons Attribution 4.0 International license

Figure 15. Candidal Diaper Rash With Satellite Lesions



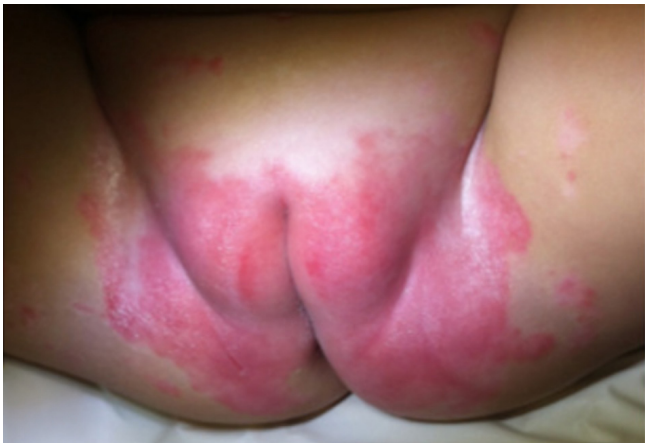
Intertriginous erythematous plaques with satellite papules and pustules.
Reprinted from Sirirus Lebsing, Jitjira Chaiyarit, Leelawadee Techasatian. Diaper rashes can indicate systemic conditions other than diaper dermatitis. *BMC Dermatology*. 2020;20(1):7. © The Author(s). https://doi.org/10.1186/s12895-020-00104-z Used under the Creative Commons Attribution 4.0 International license

Figure 16. Seborrheic Dermatitis



Intertriginous erythema and scale in the neck folds of a child with seborrheic dermatitis.
Reprinted from Anca Chiriac, Uwe Wollina. Pediatric dermatitis seborrhoica - a clinical and therapeutic review. *Indian Dermatology Online Journal*. Volume 15, Issue 3. Pages 383-391. https://journals.lww.com/idoj/pages/default.aspx Used with permission of Wolters Kluwer Medknow Publications and the Indian Association of Dermatologists, Venerologists and Leprologists.

Figure 17. Napkin Psoriasis



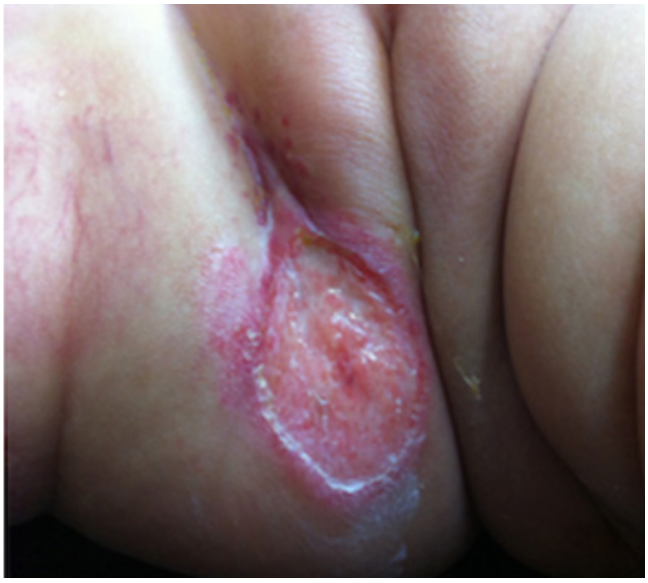
Well demarcated erythematous scaly plaques.
Reprinted from Sirirus Lebsing, Jitjira Chaiyarit, Leelawadee Techasatian. Diaper rashes can indicate systemic conditions other than diaper dermatitis. *BMC Dermatology*. 2020;20(1):7. © The Author(s). https://doi.org/10.1186/s12895-020-00104-z Used under the Creative Commons Attribution 4.0 International license

an annular ulceration, leading the clinician to consider other causes, including infection. These lesions can be exquisitely painful with urination and stooling and may develop superinfection and/or bleeding. Segmental infantile hemangioma precursors in the diaper area may initially be misdiagnosed as a diaper rash. It is important to make the appropriate diagnosis, as these lesions can be associated with extracutaneous anomalies in association with LUMBAR syndrome (lower-body hemangiomas, urogenital abnormalities, myelopathy of the spinal cord, bony deformities, anorectal malformations and arterial anomalies, renal anomalies).[34] For these reasons, infantile hemangiomas in the diaper area often require urgent dermatology referral, as treatment with systemic medications may be warranted to avoid potential complications of ulceration, pain, bleeding, infection, and scarring. Wound cultures should be obtained, and empiric topical antibiotics and a protective dressing should be considered.[35] Additional antibiotic treatment can be guided by the results of wound cultures and response to empiric treatment. If available, infectious disease consult can help when there is suspicion for an infectious cause of diaper rash that is not responsive to empiric treatment.

Other Conditions

Less common but more worrisome causes of diaper rash include underlying systemic disease such as Langerhans cell histiocytosis **(see Figure 19)** or acrodermatitis enteropathica (zinc deficiency) **(see Figure 20)**. These should be considered for extensive, chronic, or recalcitrant diaper rashes that have failed traditional methods of treatment.[36]

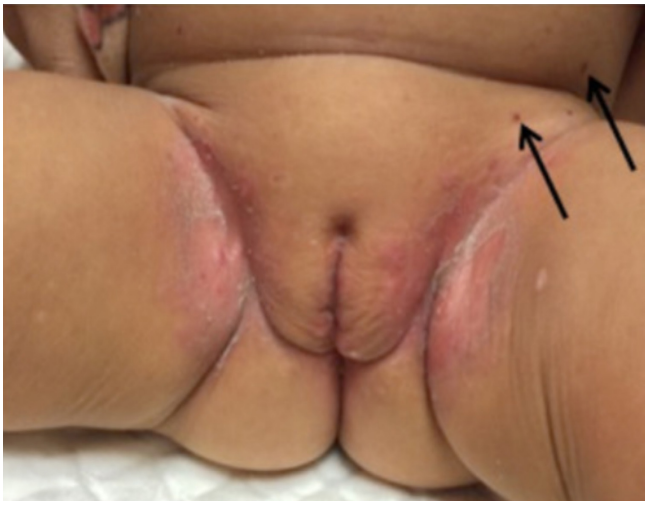
Figure 18. Hemangioma Precursor



Infantile hemangioma precursor presenting as an ulceration in the diaper area. Note visual cues such as peripheral coarse telangiectasia.

Reprinted from Sirirus Lebsing, Jitjira Chaiyarit, Leelawadee Techasatian. Diaper rashes can indicate systemic conditions other than diaper dermatitis. *BMC Dermatology*. 2020;20(1):7. © The Author(s). https://doi.org/10.1186/s12895-020-00104-z Used under the Creative Commons Attribution 4.0 International license

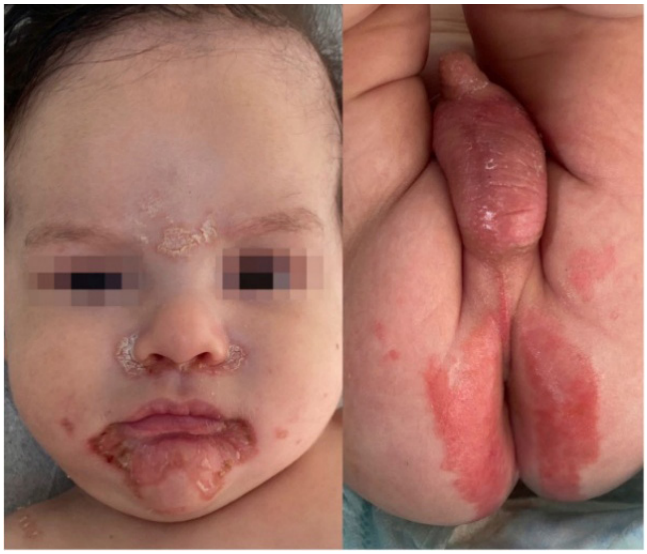
Figure 19. Langerhans Cell Histiocytosis



The arrows indicate petechiae/hemorrhagic lesions in addition to diaper rash, the presence of which is a diagnostic clue for Langerhans cell histiocytosis.

Reprinted from Sirirus Lebsing, Jitjira Chaiyarit, Leelawadee Techasatian. Diaper rashes can indicate systemic conditions other than diaper dermatitis. *BMC Dermatology*. 2020;20(1):7. © The Author(s). https://doi.org/10.1186/s12895-020-00104-z Used under the Creative Commons Attribution 4.0 International license

Figure 20. Acrodermatitis Enteropathica



Acrodermatitis enteropathica (zinc deficiency) can present as recalcitrant diaper dermatitis. Additional clues may include perioral or acral lesions.

Reprinted from Luciane Francisca Fernandes Botelho, Selma Hélène, Carolina Gonçalves Contin Proença, et al. Transient neonatal zinc deficiency or acrodermatitis enteropathica? *Anais Brasileiros de Dermatologia*. 2024;99(5):763-765. © 2024 Sociedade Brasileira de Dermatologia. https://doi.org/10.1016/j.abd.2023.08.018 Used under the Creative Commons Attribution 4.0 International license

Scabies in a neonate may present as characteristic nodules in the diaper area and/or axillae, although it also commonly appears as crusted papular lesions that mimic vesicles, and can be widespread in this young age group. **(See Figure 21.)** Due to the varying morphologies that may be found in neonatal/infantile scabies, this diagnosis should be considered in neonates presenting with vesicles/pustules/bullae, eczematous dermatoses, and diaper rashes. Because scabies is spread by direct contact, the caregiver may be symptomatic as well. Assessment for additional clinical clues such as associated pruritus and household contacts with similar eruptions is warranted. On occasion, the infection can be the result of a hospital-acquired infection during the perinatal period.

Special Populations

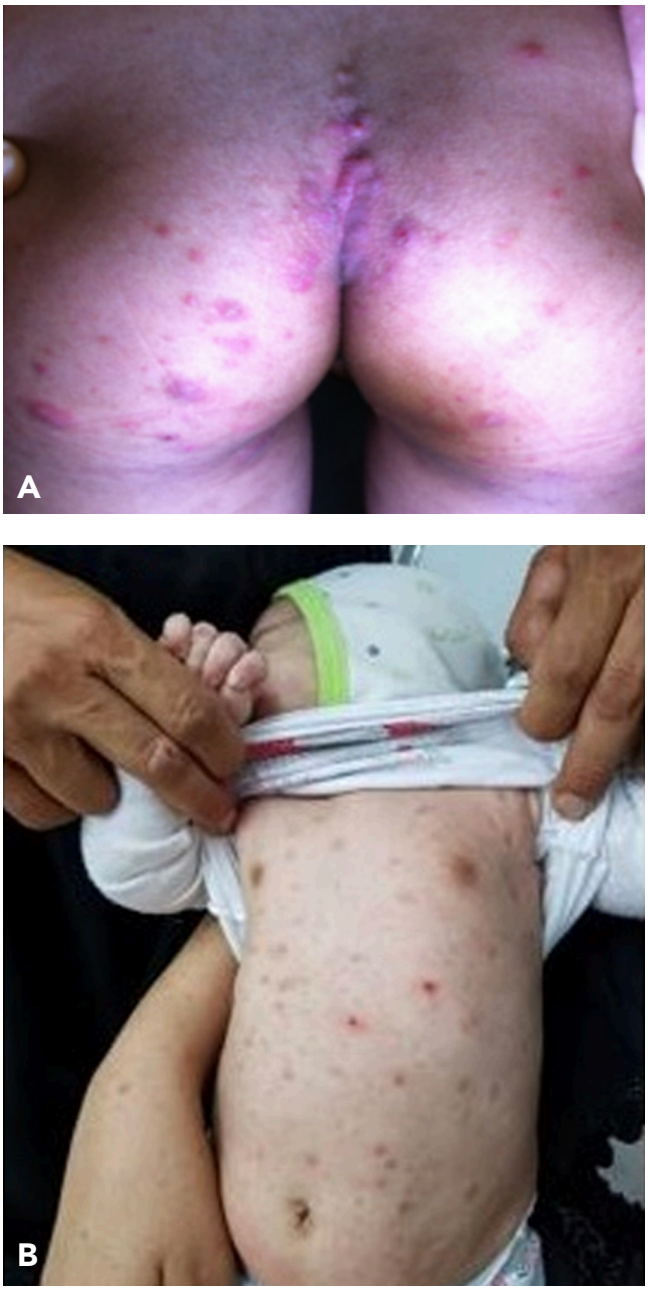
Historically, dermatologic medical education has been taught primarily using photographs of various skin conditions in patients with lighter skin tones. Today, there are multiple ongoing initiatives to improve recognition of skin findings in skin of color. The American Academy of Dermatology provides free CME education through their Skin of Color Curriculum (available at: https://learning.aad.org/Listing/Skin-of-Color-Curriculum-5719), and VisualDx.com is a subscription-required resource that offers photographs of skin findings in a range of skin types.

Controversies and Cutting Edge

Neonatal rashes encompass a wide spectrum of conditions, some of which can have significant risks to newborns, including HSV, SSSS, atopic dermatitis, and some forms of diaper dermatitis. One of the most feared neonatal skin lesions is HSV, due to its potentially devastating consequences. One of the biggest advancements in the management of suspected neonatal HSV was the implementation of rapid in-house PCR HSV testing. A 2024 retrospective study evaluating 259 neonates in a single institution showed that implementation of in-house PCR testing for HSV resulted in more rapid diagnosis, an overall decrease in length of hospital stay, and more complete diagnostic workups. The study also demonstrated that locations that had rapid in-house PCR HSV testing had a decreased median duration of acyclovir therapy and, thus, decreased time that the infant was exposed to the medication (which can be nephrotoxic).[37]

Perhaps one of the more concerning findings in the latest research surrounding HSV in the neonatal period is its potential association with cognitive impairments later in life. A 2025 study demonstrated that subclinical HSV infection in neonatal mice can lead to a higher risk for long-term cognitive impairment, including Alzheimer disease. This study not only reinforces the importance of early and rapid identification and treatment but also highlights the importance of further studies in patients potentially affected by subclinical HSV infections.[38]

Figure 21. Scabies



View A. Erythematous nodules in the diaper area.
Reprinted from Sirirus Lebsing, Jitjira Chaiyarit, Leelawadee Techasatian. Diaper rashes can indicate systemic conditions other than diaper dermatitis. *BMC Dermatology*. 2020 Sep 21;20(1):7. © The Author(s). https://doi.org/10.1186/s12895-020-00104-z Used under the Creative Commons Attribution 4.0 International license

View B. Scattered diffuse hyperpigmented and erythematous papules, pustules, and crusting in an infant with scabies.
Reprinted from Sima Rasti, Rezvan Talaee, Amir Abdoli. Disseminated scabies in a 2-month-old infant. *Clinical Case Reports*. 2022;10(9):e6334. © 2022 The Authors. https://doi.org/10.1002/ccr3.6334 Used under the Creative Commons Attribution 4.0 International license

While significant improvements have been made in understanding, rapid diagnosis, and management of dangerous neonatal rashes and skin conditions, ongoing research into an HSV vaccine, long-term sequelae of HSV exposure, and early emollient use and its association with atopic dermatitis, further research and dialogue are essential to address existing controversies and enhance outcomes for this vulnerable population.

Disposition

Disposition of a neonate presenting with a skin lesion depends on many factors. If an infectious workup has been completed, then admission, discharge, and follow-up should follow AAP guidelines.[10] Diffuse cutaneous infection, even in the absence of fever, may warrant admission for ongoing monitoring and parenteral antimicrobial therapy.

If a neonatal rash is thought to be benign, anticipatory guidance, with return precautions and close follow-up remains essential. Ensuring a patient has good access to primary care is prudent before discharge. Urgent dermatology referral should be placed for those at high risk, including infants with a diaper hemangioma or neonates with a diffuse or recalcitrant eczematous rash or diaper dermatitis for ongoing evaluation and management. Neonates at risk for neonatal lupus erythematosus or a neonate with concern for nutritional deficiency may require hospital admission for further evaluation and management.

Summary

Neonatal skin conditions can be challenging to evaluate when they present to ED. A neonate's immature immune system places them in a particularly vulnerable population at risk for invasive infections when the skin barrier is compromised. By having awareness of high-risk skin findings, a clinician can more confidently classify the lesions and establish a safe workup, treatment, and disposition plan.

Many skin findings in the neonatal period can be broadly classified into 4 categories: (1) vesicles, pustules, and bullae; (2) erythroderma with or without desquamation; (3) eczematous rashes; and (4) diaper dermatitis. When evaluating a neonatal rash, a complete history and physical examination are essential to develop and narrow the differential diagnosis. While many neonatal eruptions are benign and resolve on their own with minimal or no intervention, the presence of reported or documented fever (temperature of ≥38°C) with or without rash in a neonate aged <21 days requires a full sepsis workup; this includes a

5 Things That Will Change Your Practice

1. The AAP neonatal fever guidelines should be uniformly applied to all infants aged <60 days presenting with fever.[10] Mild or nonspecific rashes in this age group may signal serious infection. Evaluation must proceed without delay; a complete sepsis workup and empiric therapy should be initiated in accordance with the AAP 2021 algorithm to minimize the risk for missed diagnoses of bacterial sepsis, meningitis, or HSV infection.
2. HSV PCR testing should be performed at the initial presentation of vesicular, erosive, or pustular lesions. Unroofed lesion samples, CSF, and blood samples must be collected as early as possible, ideally before or at the time of initiation of acyclovir therapy. Early testing allows for discontinuation of antiviral therapy as soon as possible if results are negative.
3. Negative culture results from bullae, vesicles, or erythrodermic skin should not lead to premature reassurance or a reduction in the level of care. For neonates, cultures should be obtained, and the possibility of ongoing infection must be considered despite negative results. Empiric antimicrobial coverage should be continued until the infant demonstrates clear clinical improvement or an alternative diagnosis is established.
4. A broad range of photographic references should be used to improve identification of neonatal rashes across diverse skin tones. Resources should be integrated into decision-making and teaching to enhance recognition of skin manifestations across all skin tones.
5. Hemangiomas in the diaper region should be recognized as high-risk lesions that require early referral to dermatology rather than observation alone. Wound care should be initiated promptly, lesion characteristics documented, and caregivers educated about gentle cleansing, barrier protection, and signs of ulceration or infection.

Case Conclusions

CASE 1

For the 10-day-old boy who was brought in for a rash that developed earlier in the day...

Your primary concern for this patient was neonatal HSV infection. You sent lesional, skin surveillance, serum, and CSF PCR testing. The newborn was admitted to the hospital and treated with IV acyclovir while waiting for the HSV PCR result. The HSV PCR was positive. Based on the PCR results, you diagnosed the boy with skin, eyes, and mouth disease. He required 14 days of inpatient IV acyclovir followed by suppressive therapy with oral acyclovir.

CASE 2

For the 4-week-old girl who was brought in by her mother for a worsening rash...

Based on the xerotic lesions on her extremities, you diagnosed the girl with infantile atopic dermatitis. There were no vesicles, erosions, or crusting suggestive of bacterial or viral superinfection. The girl was breastfeeding well and gaining weight, according to her pediatrician. She was discharged home with reassurance, dry skin care recommendations including bathing and bland emollient use, as well as a prescription for hydrocortisone 1% ointment to be used twice a day for the subsequent week, with close follow-up with her pediatrician in the coming days.

CASE 3

For the 4-week-old boy who was referred by his primary care doctor for evaluation of a rash...

You diagnosed the boy with SSSS. Bacterial skin cultures and blood work, including a blood culture, were collected. The boy was peri-febrile on his presentation, he was older than 21 days, and he did not have a documented fever, so a lumbar puncture was deferred. The boy was initially started on treatment with IV cefazolin and IV vancomycin due to MRSA concern. Skin cultures grew MSSA, and upon stabilization and improvement of his skin erythema and tenderness, he was transitioned to oral cephalexin and emollient use upon discharge.

CASE 4

For the 3-week-old girl who presented with a rash in her diaper area...

The newborn appeared to have an ulceration. While erosions and ulceration can be seen with irritant contact dermatitis, the presence of an isolated quarter-sized ulceration with bleeding was atypical. This raised your concern for an infantile hemangioma precursor. A culture was performed. The parents were instructed to cover the area with a sterile nonstick dressing. Mupirocin ointment was applied to the dressing prior to application and changed daily. The girl was evaluated by dermatology the following day, and low-dose oral propranolol therapy was considered as additional therapy.

lumbar puncture and empiric treatment with systemic antibiotics and possibly antiviral therapy in accordance with the AAP guidelines.[10] Importantly, any vesicular, pustular, or punched-out erosive skin lesion should raise concern for HSV and requires prompt workup and empiric treatment with acyclovir until the diagnosis is confirmed. When a diagnosis of SSSS is likely, prompt treatment for methicillin-susceptible *S aureus* with nafcillin or oxacillin or a first- or second-generation cephalosporin is appropriate. If there is concern for MRSA, addition of vancomycin should be considered. Diaper dermatitis is a common concern in the neonatal period; however, the presence of bacterial, viral, or fungal superinfection and infantile hemangiomas require more detailed attention and dedicated treatment.

Multimedia images of the various skin disorders can aid with diagnosis, follow-up, and treatment for the initial care team and subsequent inpatient and/or outpatient clinicians. In addition, ensuring clinician comfort in evaluating skin findings across various skin tones is essential to properly identify various skin conditions in patients of all racial and ethnic groups.

Time- and Cost-Effective Strategies

Most infant rashes do not require further workup; the skin lesions discussed in this issue are some of the exceptions in the neonatal period. Taking the time to provide reassurance and anticipatory guidance to families of patients with benign skin lesions is essential to prevent return to the ED. Ensuring adequate and close follow-up can also help to prevent unnecessary re-presentation to the ED for a benign neonatal skin condition. This will also help with reducing a neonate's exposure to the ED and risk for acquired infections through repeat visits.

Risk Management Pitfalls for Neonates With Rashes in the Emergency Department

1. **"After examining the newborn, I thought it was just a viral rash. There was no need for further workup."** Even if a rash appears consistent with a viral exanthem, any young infant with a fever >38°C requires a full sepsis workup, according to the AAP guidelines.[10] Certain viral rashes (eg, HSV) can be life-threatening, and early evaluation and treatment are crucial to avoid missing serious infections.

2. **"I thought the rash was probably benign. The baby looked healthy and was acting well."** A thorough history and physical examination are essential, including the mother's prenatal history and any history of contact with ill family members or caregivers. Key historical details often provide diagnostic clues.

3. **"I wanted to get acyclovir started quickly. I decided to get swabs later."** If there is any concern for HSV, comprehensive swabs, including those for PCR, should be obtained as early as clinically feasible. Early treatment is important, but diagnostic confirmation ensures targeted therapy.

4. **"Negative cultures meant the rash wasn't an infection."** Negative cultures in cases of desquamation do not rule out infection. Conditions such as SSSS are toxin-mediated, and if the lesions themselves are cultured, those lesions may be negative.

5. **"The rash looked bad, but I wasn't sure if it needed further workup."** Although most rashes in infants are self-limited and harmless, the ones highlighted in this issue represent important exceptions. Prompt recognition of these high-risk skin conditions is essential for early diagnosis and appropriate management.

6. **"The rash looked benign. Follow-up wasn't necessary."** At discharge, it is essential to ensure follow-up with a primary care clinician to monitor rash evolution. This can be challenging if outpatient care is not already established, but follow-up is key to monitoring progression and minimizing risk for complications.

7. **"A picture wouldn't really help."** Collecting multimedia imaging of the rash and sharing it with clinicians during follow-up is exceptionally helpful. Photos provide objective documentation and aid in monitoring evolution of skin findings over time.

8. **"I thought the rash was not serious, so I reassured the family."** Skin lesions that rapidly change or evolve require close monitoring and follow-up, even if initially considered benign. Rapid changes may indicate underlying pathology. Anticipatory guidance to families regarding concerning signs and symptoms that warrant reevaluation should be provided even if the diagnosis is benign, based on clinical findings.

9. **"I thought it was just a diaper rash. I didn't give the parents a time frame for when it should clear up because I just assumed it would get better."** Be wary of diaper rashes that do not respond to standard treatment over approximately 2 weeks. Persistent or worsening diaper rashes should raise concern for a possible systemic cause, such as Langerhans cell histiocytosis, a metabolic issue, or a hemangioma precursor.

10. **"I was not familiar with what the rash looked like in a darker skin tone. I diagnosed it incorrectly because it looked different from the rash I have seen on other patients."** As a clinician, it is important to recognize and address your own comfort level when evaluating skin lesions in all ethnic and racial groups. Have resources available to guide management when you are uncertain, to avoid misdiagnosis or delayed care.

References

Evidence-based medicine requires a critical appraisal of the literature based upon study methodology and number of subjects. Not all references are equally robust. The findings of a large, prospective, randomized, and blinded trial should carry more weight than a case report.

To help the reader judge the strength of each reference, pertinent information about the study will be included in bold type following the reference, where available. In addition, the most informative references cited in this paper, as determined by the authors, are noted by an asterisk (*) next to the number of the reference.

1.* Siegel M, Lee LW. Neonatal skin emergencies. *Pediatr Ann.* 2019;48(1):e36-e42. **(Review)** **DOI: 10.3928/19382359-20181210-03**

2.* Chadha A, Jahnke M. Common neonatal rashes. *Pediatr Ann.* 2019;48(1):e16-e22. **(Review)** **DOI: 10.3928/19382359-20181206-01**

3. Cully M, Jackson BF. Newborn with a rash. *Ann Emerg Med.* 2017;70(5):746-755. **(Case report; 1 patient)**

4. Hu MS, Borrelli MR, Hong WX, et al. Embryonic skin development and repair. *Organogenesis.* 2018;14(1):46-63. **(Review)**

5. Marcoux D. Nongenetic neonatal rashes and blisters. Presented at: 24th World Congress of Dermatology; June 11, 2019; Milan, Italy. Session: Daily Scientific Programme. **(Presentation)**

6. Holmes N, Walker JJ, Chapple W. Newborn with desquamating rash. *J Fam Pract.* 2019;68(3):175-177. **(Case report; 1 patient)**

7. Hattori F, Kawamura Y, Kozawa K, et al. Clinical characteristics of primary HHV-6B infection in children visiting the emergency room. *Pediatr Infect Dis J.* 2019;38(10):e248-e253. **(Retrospective study; 93 patients)**

8. McDonald R, O'Callaghan K, Torrone E, et al. Vital signs: missed opportunities for preventing congenital syphilis - United States, 2022. *MMWR Morb Mortal Wkly Rep.* 2023;72(46):1269-1274. **(Epidemiological study, nationwide data; 3761 cases)**

9. Parker MG, Gupta A, Healy H, et al. Variation in United States COVID-19 newborn care practices: results of an online physician survey. *BMC Pediatr.* 2022;22(1):55. **(Survey study; 296 physicians)**

10.* Pantell RH, Roberts KB, Adams WG, et al. Evaluation and management of well-appearing febrile infants 8 to 60 days old. *Pediatrics.* 2021;148(2):e2021052228. **(Clinical guideline)** **DOI: 10.1542/peds.2021-052228**

11. Oji V, Tadini G, Akiyama M, et al. Revised nomenclature and classification of inherited ichthyoses: results of the First Ichthyosis Consensus Conference in Soreze 2009. *J Am Acad Dermatol.* 2010;63(4):607-641. **(Review)**

12.* Bolognia JL, Schaffer JV, Cerroni L. *Dermatology.* 4th ed: Elsevier; 2017. **(Book chapter)**

13. Kimberlin DW, Barnett ED, Lynfield R, et al. *Red Book.* 32nd ed: American Academy of Pediatrics; 2021:407-471. **(Book chapter)**

14. Badawy MK, Hurrell S, Baldwin C, et al. Prolonged fever and hyperferritinaemia: a puzzling diagnosis of neonatal herpes simplex virus infection during COVID-19 pandemic. *BMJ Case Rep.* 2021;14(3):e241405. **(Case report; 1 patient)**

15. Harris JB, Holmes AP. Neonatal herpes simplex viral infections and acyclovir: an update. *J Pediatr Pharmacol Ther.* 2017;22(2):88-93. **(Review)**

16.* Cruz AT, Nigrovic LE, Xie J, et al. Predictors of invasive herpes simplex virus infection in young infants. *Pediatrics.* 2021;148(3):e2021050052. **(Prospective study; 1367 infants)** **DOI: 10.1542/peds.2021-050052**

17. Kimberlin DW, Lin CY, Jacobs RF, et al. Safety and efficacy of high-dose intravenous acyclovir in the management of neonatal herpes simplex virus infections. *Pediatrics.* 2001;108(2):230-238. **(Randomized controlled trial; 74 infants)**

18. Manice CS, Planet PJ, Chase HS, et al. Management of afebrile neonates with pustules and vesicles in a pediatric emergency department. *Pediatr Dermatol.* 2018;35(5):660-665. **(Retrospective study; 73 patients)**

19.* Yun S, Cotton C, Faith EF, et al. Management of pustules and vesicles in afebrile infants ≤60 days evaluated by dermatology. *Pediatrics.* 2024;154(1):e2023064364. **(Retrospective study; 248 infants)** **DOI: 10.1542/peds.2023-064364**

20. Fertitta L, Welfringer-Morin A, Rigourd V, et al. Neonatal staphylococcal scalded skin syndrome in a breastfed neonate. *J Eur Acad Dermatol Venereol.* 2020;34(1):e36-e38. **(Case report; 1 patient)**

21. Delgado-Miguel C, Vincent S, Miguel-Ferrero M, et al. Neonatal severe staphylococcal scalded skin syndrome: management with autoadhesive skin substitute dressing (Suprathel®). *Indian J Pediatr.* 2024;91(9):984. **(Case report; 1 patient)**

22. Nusman CM, Blokhuis C, Pajkrt D, et al. Staphylococcal scalded skin syndrome in neonates: case series and overview of outbreaks. *Antibiotics* (Basel). 2022;12(1):38. **(Case series; 7 neonates)**

23.* Liy-Wong C, Pope E, Weinstein M, et al. Staphylococcal scalded skin syndrome: an epidemiological and clinical review of 84 cases. *Pediatr Dermatol.* 2021;38(1):149-153. **(Retrospective cohort; 84 patients)** **DOI: 10.1111/pde.14470**

24.* Gray L, Olson J, Brintz BJ, et al. Staphylococcal scalded skin syndrome: clinical features, ancillary testing, and patient management. *Pediatr Dermatol.* 2022;39(6):908-913. **(Retrospective cohort; 67 patients)** **DOI: 10.1111/pde.15102**

25. Brazel M, Desai A, Are A, et al. Staphylococcal scalded skin syndrome and bullous impetigo. *Medicina* (Kaunas). 2021;57(11)1157. **(Review)**

26. Zou Y, Zhang J, Ye X, et al. Neonatal staphylococcal scalded skin syndrome: a case report. *Nursing Communications.* 2021;5(3):115–119. **(Case report; 1 patient)**

27.* Stafford IA, Workowski KA, Bachmann LH. Syphilis complicating pregnancy and congenital syphilis. *N Engl J Med.* 2024;390(3):242-253. **(Review)** **DOI: 10.1056/NEJMra2202762**

28. Horimukai K, Morita K, Narita M, et al. Application of moisturizer to neonates prevents development of atopic dermatitis. *J Allergy Clin Immunol.* 2014;134(4):824-830.e6. **(Randomized controlled trial; 118 infants)**

29. Youssef MJ, Chiu YE. Eczema and urticaria as manifestations of undiagnosed and rare diseases. *Pediatr Clin North Am.* 2017;64(1):39-56. **(Review)**

30. Vanoni F, Lava SAG, Fossali EF, et al. Neonatal systemic lupus erythematosus syndrome: a comprehensive review. *Clin Rev Allergy Immunol.* 2017;53(3):469-476. **(Review)**

31. Mohammed J, Mehrotra S, Schulz H, et al. Severe infant rash resistant to therapy due to zinc deficiency. *Pediatr Emerg Care.* 2017;33(8):582-584. **(Case report; 1 patient)**

32. Ference JD, Last AR. Choosing topical corticosteroids. *Am Fam Physician.* 2009;79(2):135-140. **(Review)**

33. Benitez Ojeda A, Mendez M. Diaper dermatitis. *StatPearls:* NCBI Bookshelf version. StatPearls Publishing; 2023. Available at: https://www.ncbi.nlm.nih.gov/books/NBK559067/ **(Online book chapter)**

34. Metry D, Copp HL, Rialon KL, et al. Delphi consensus on diagnostic criteria for LUMBAR syndrome. *J Pediatr.* 2024;272:114101. **(Review)**

35. Thoreby CV, Walsh BH. The periorbital rash of neonatal lupus. *J Pediatr.* 2022;242:258-259. **(Case report; 1 patient)**
36. Shimizu M, Sakai S, Tatekawa Y, et al. An infant with PELVIS (perineal hemangioma, external genital malformations, lipomyelomeningocele, vesicorenal abnormalities, imperforate anus, and skin tag) syndrome misdiagnosed as diaper rash. *J Pediatr.* 2014;165(3):634. **(Case report; 1 patient)**
37. Patt EM, Ribes JA, Long LM, et al. Optimizing neonatal herpes simplex virus evaluations: influence of in-house serum polymerase chain reaction performance on diagnostic turnaround, acyclovir duration, and hospital length of stay. *J Pediatric Infect Dis Soc.* 2024;13(9):501-503. **(Retrospective cohort; 259 children)**
38. Dutton AJ, Turnbaugh EM, Patel CD, et al. Asymptomatic neonatal herpes simplex virus infection in mice leads to persistent CNS infection and long-term cognitive impairment. *PLoS Pathog.* 2025;21(2):e1012935. **(Animal study)**

CME Questions

Current subscribers receive CME credit absolutely free by completing the following test. Each issue includes 4 *AMA PRA Category 1 Credits™*, 4 ACEP Category I credits, 4 AAP Prescribed credits, and 4 AOA Category 2-B credits. Online testing is available for current and archived issues. To receive your free CME credits for this issue, scan the QR code below with your smartphone or visit **www.ebmedicine.net/P1225**

1. For a neonate aged <21 days with a fever and a vesicular rash, what is the most appropriate next step?
a. Administer parenteral antibiotics and antiviral medications.
b. Perform a lumbar puncture.
c. Collect specimens to evaluate for bacterial and viral infections.
d. All of the above.

2. A 6-day-old neonate is afebrile but has vesicular lesions on the scalp and gluteal area. Cultures and polymerase chain reaction (PCR) for herpes simplex virus (HSV) have been collected. What is the best next step in management while awaiting results?
a. Observe and discharge with close outpatient follow-up.
b. Start parenteral acyclovir and admit for observation.
c. Perform a lumbar puncture only if symptoms worsen.
d. Begin oral acyclovir and schedule outpatient dermatology referral.

3. A 4-week-old neonate with erythematous desquamation in the axillae and neck folds is diagnosed with staphylococcal scalded skin syndrome (SSSS). Cultures from ruptured bullae are negative for bacterial growth. What is the best next step in management?
a. Continue empiric antibiotic therapy targeting methicillin-susceptible *Staphylococcus aureus.*
b. Discontinue antibiotics and initiate antifungal therapy.
c. Perform a biopsy of the affected skin to confirm diagnosis.
d. Reassure and the discharge with follow-up in 1 week.

4. A neonate presents with annular, erythematous plaques with central clearing on the trunk and extremities. The mother had untreated syphilis during pregnancy. What diagnostic findings confirm the suspected diagnosis, and how should the neonate be managed?
a. Positive treponemal serology and elevated rapid plasma reagin titer; initiate penicillin G therapy.
b. Negative syphilis serology and peeling skin; provide emollient therapy.
c. Positive HSV PCR and vesicular rash; start intravenous acyclovir.
d. Positive fungal culture from the plaques; apply topical antifungal therapy.

5. What test is essential in confirming congenital syphilis in a neonate with skin peeling and systemic symptoms?
a. Blood culture for syphilis
b. Quantitative nontreponemal serologic titer comparison with maternal titer
c. Serum HSV PCR testing
d. Biopsy of skin lesions

6. A 3-week-old neonate presents with scaly plaques on the forehead and periorbital area. The lesions worsen with sun exposure. The infant's electrocardiogram reveals a prolonged PR interval. What is the most likely diagnosis, and what additional evaluation is recommended?
a. Atopic dermatitis; start low-potency corticosteroids and monitor.
b. Neonatal lupus erythematosus; evaluate for anti-Ro/SSA and anti-La/SSB antibodies.
c. Seborrheic dermatitis; recommend emollients and dandruff shampoo.
d. Congenital syphilis; perform serum treponemal and nontreponemal tests.

7. **A neonate presents with erythematous macules and papules coalescing into plaques. The rash spares the diaper area but involves the trunk and limbs. There is no fever, and the infant appears well. What is the most appropriate workup and diagnosis?**
   a. Skin biopsy and bacterial cultures for SSSS
   b. Allergy testing for contact dermatitis
   c. Diagnosis of atopic dermatitis with low-potency corticosteroids and emollients
   d. Immediate lumbar puncture and systemic antibiotics

8. **A neonate presents with an erythematous diaper rash with satellite lesions. What is the most likely diagnosis and initial management?**
   a. Irritant contact dermatitis; apply zinc oxide ointment.
   b. Candidal dermatitis; apply topical antifungal therapy.
   c. Hemangioma; refer to dermatology for systemic treatment.
   d. Allergic contact dermatitis; discontinue diapers and apply hydrocortisone.

9. **A 4-week-old infant is brought to the emergency department for a worsening rash in the diaper area. The rash began as a red patch 10 days ago but has since become painful, raw, and intermittently bleeds. The infant cries during diaper changes and bowel movements. Previous treatments with barrier creams and a 5-day course of topical nystatin have had no effect. On examination, there is a deep, annular ulceration with overlying crust on the left gluteal cheek, surrounded by a faint halo of telangiectatic vessels. The remainder of the skin examination is normal. The infant is afebrile and well appearing. Which of the following is the most likely diagnosis, and what is the most appropriate next step in management?**
   a. Candidal diaper dermatitis; initiate oral fluconazole.
   b. Irritant diaper dermatitis; switch to hydrocortisone 1% and increase diaper changes.
   c. Langerhans cell histiocytosis; obtain skin biopsy and refer to oncology.
   d. Ulcerated infantile hemangioma; initiate topical antibiotics and refer to dermatology.

10. **A neonate presents with a diaper rash that has not improved with standard treatment. Examination reveals crusted scaly reddish-brown papules and a few petechiae. The patient also has a similar rash in the posterior scalp. What is the most appropriate next step?**
    a. Treat with topical antibiotics.
    b. Refer to dermatology for further evaluation.
    c. Initiate antifungal treatment for candidiasis.
    d. Discharge with reassurance and follow-up in 1 month.

Class of Evidence Definitions

Each action in the clinical pathways section of *Pediatric Emergency Medicine Practice* receives a score based on the following definitions.

Class I
- Always acceptable, safe
- Definitely useful
- Proven in both efficacy and effectiveness

Level of Evidence:
- One or more large prospective studies are present (with rare exceptions)
- High-quality meta-analyses
- Study results consistently positive and compelling

Class II
- Safe, acceptable
- Probably useful

Level of Evidence:
- Generally higher levels of evidence
- Nonrandomized or retrospective studies: historic, cohort, or case control studies
- Less robust randomized controlled trials
- Results consistently positive

Class III
- May be acceptable
- Possibly useful
- Considered optional or alternative treatments

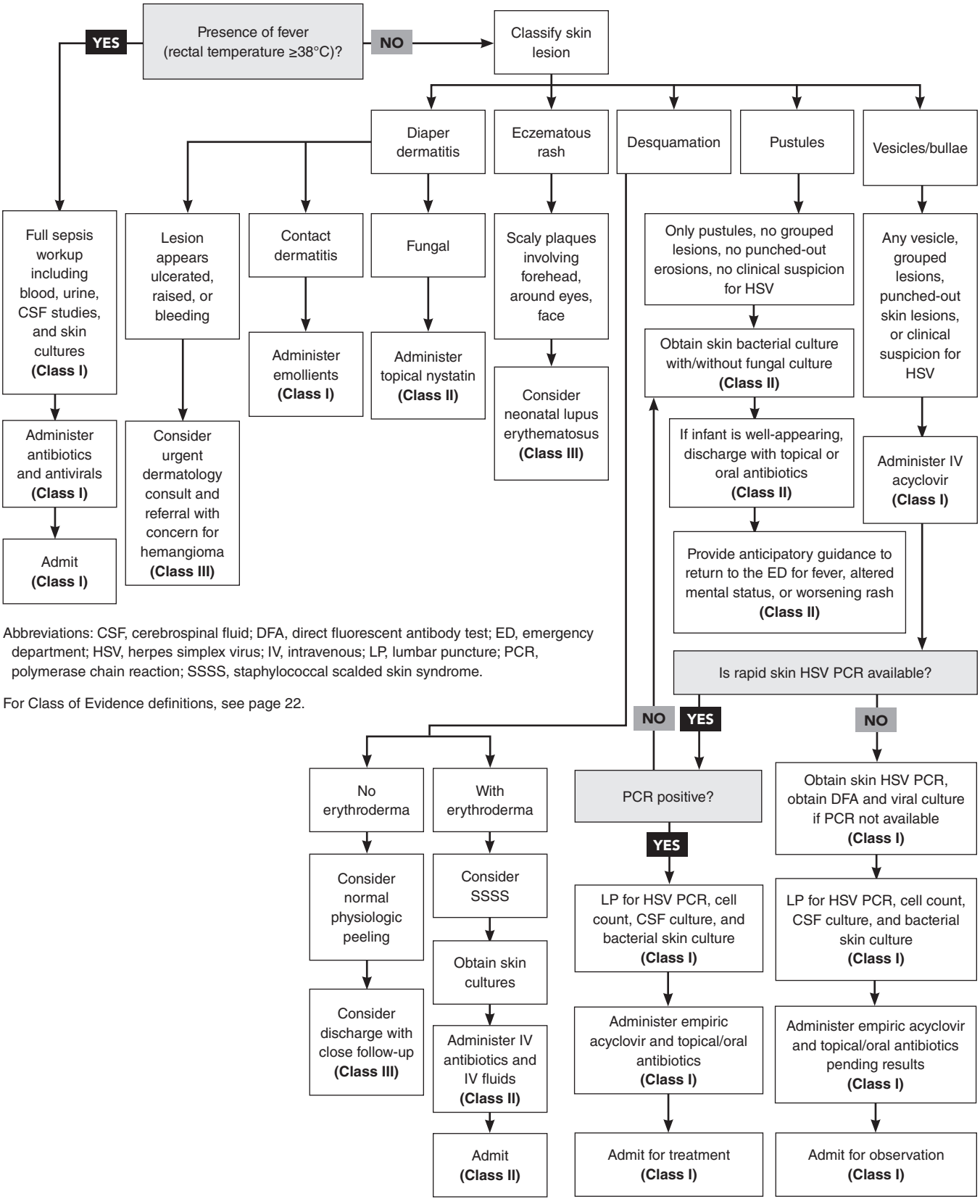
Level of Evidence:
- Generally lower or intermediate levels of evidence
- Case series, animal studies, consensus panels
- Occasionally positive results

Indeterminate
- Continuing area of research
- No recommendations until further research

Level of Evidence:
- Evidence not available
- Higher studies in progress
- Results inconsistent, contradictory
- Results not compelling

Clinical Pathway for Emergency Department Management of Neonatal Rashes and Skin Lesions

Click or scan for interactive pathway

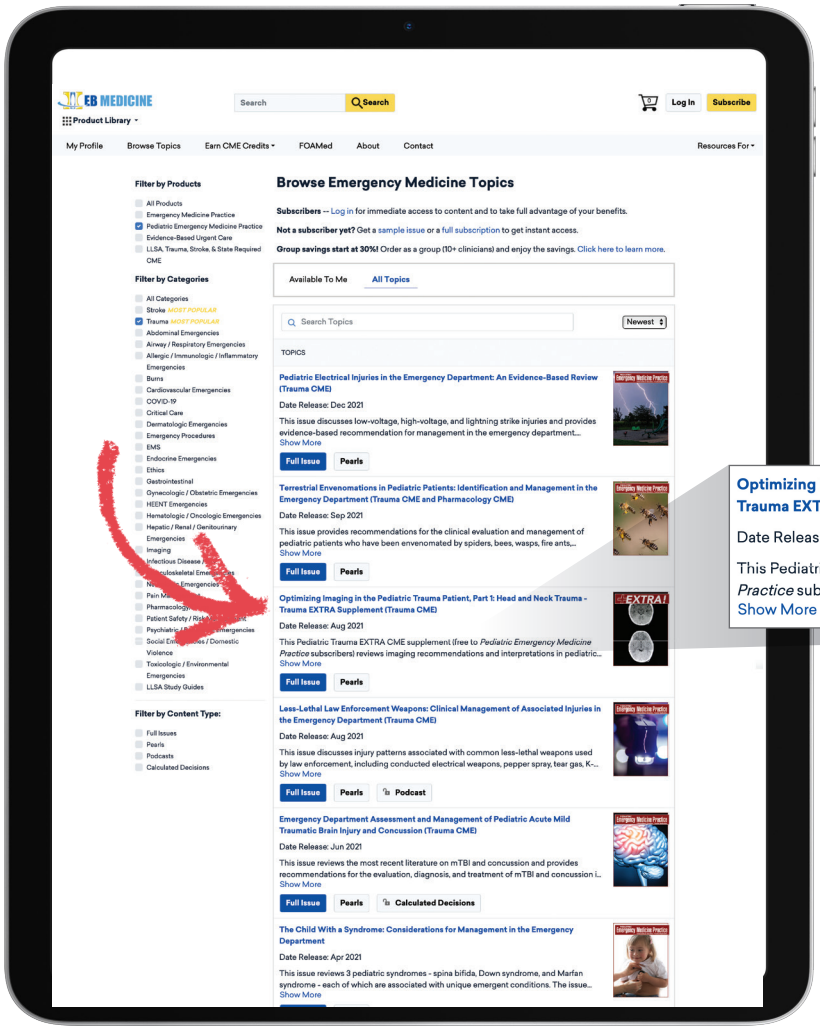


Abbreviations: CSF, cerebrospinal fluid; DFA, direct fluorescent antibody test; ED, emergency department; HSV, herpes simplex virus; IV, intravenous; LP, lumbar puncture; PCR, polymerase chain reaction; SSSS, staphylococcal scalded skin syndrome.

For Class of Evidence definitions, see page 22.

Appendix 1. Common Dermatologic Descriptors[2,3,5,6,12]

	Term	Description	Example
Primary lesions	Macule/patch	• Macule, <1 cm in diameter; patch, >1 cm in diameter • Flat, nonpalpable, circumscribed area; differs in color from surrounding skin	• Petechiae • Flat component of viral exanthem
	Papule/plaque	• Papule, <1 cm in diameter; plaque, >1 cm in diameter • Raised, circumscribed area of skin	• Atopic dermatitis • Seborrheic keratosis • Elevated component of viral exanthem
	Vesicle/bulla	• Elevated, circumscribed • Vesicle, <1 cm in diameter; bulla >1 cm in diameter • Fluid-filled • May become eroded, pustular, or umbilicated	• Vesicles in herpes simplex • Vesicles and bullae in epidermolysis bullosa
	Pustule	• Elevated, circumscribed • <1 cm in diameter • Filled with purulent fluid	• Pustule in *Staphylococcus aureus* pustulosis
	Nodule	• Palpable, raised area that involves the dermis and/or subcutis, generally >1 cm in diameter	• Scabies
	Wheal	• Transient elevation of skin secondary to dermal edema • Pale centrally, erythematous rim	• Urticaria
Secondary lesions	Erosion/ ulceration	• Partial (erosion) or full (ulceration) loss of the epidermis	• Ruptured lesions of herpes simplex (erosion) • Excoriations (erosion) • Ulcerated hemangioma (ulceration)
	Crust	• Dried serum, blood, or pus on the skin surface • Bacteria can be present	• Atopic dermatitis • Impetigo • Langerhans cell histiocytosis
	Scale	• Hyperkeratosis • Accumulation of stratum corneum	• Seborrheic dermatitis
	Hyperkeratosis	• Thickening of the epidermis	• Congenital ichthyosis
	Desquamation	• Peeling or shedding of the superficial portion of the epidermis	• Staphylococcal scalded skin syndrome • Bullous impetigo • Congenital syphilis
Color	Erythema	• Redness	• Staphylococcal scalded skin syndrome • Congenital ichthyosis • Many inflammatory conditions and skin lesions
Configuration	Annular	• Ring-shaped	• Discoid lupus
	Grouped	• Clustered together	• Herpes simplex
	Blaschkolinear	• Lines in normal skin development	• Incontinentia pigmenti
	Serpiginous	• Wavy margin	• Herpes simplex
Distribution	Acral	• Involving the extremities	• Congenital syphilis
	Seborrheic regions	• Often oily areas of body such as face, nose, eyebrows, scalp, eyelids, chest	• Seborrheic dermatitis • Staphylococcal scalded skin syndrome • Langerhans cell histiocytosis
	Linear	• Straight line	• Excoriation
	Mucosal	• Moist inner lining of some body parts including nose, mouth, lungs, stomach	• Epidermolysis bullosa



Get FREE Trauma CME and More!

Did You Know?

Your subscription includes online access to ***EXTRA*** supplements! ***EXTRAs*** make it easy to earn FREE trauma CME credit in addition to your 48 yearly CME credits; each issue includes 4 *AMA PRA Category 1 Credits™!*

Visit **www.ebmedicine.net/topics** to view the ***EXTRAs***. Go to "Filter by Categories" to find content on pediatric trauma, pharmacology, and other state-specific CME.

Access ***EXTRAs*** today on our website:
www.ebmedicine.net/topics

EB MEDICINE

The *Pediatric Emergency Medicine Practice* Editorial Board

QUICK READ

Points & Pearls

DECEMBER 2025 | VOLUME 22 | ISSUE 12

Management of Neonatal Rashes in the Emergency Department

Points

- Neonatal skin findings may be signs of infection including herpes simplex virus (HSV), syphilis, varicella, fungal infections, staphylococcal scalded skin syndrome (SSSS), or staphylococcus/streptococcus toxic shock, all of which have significant morbidity and mortality.
- It is essential to obtain a comprehensive birth history, detailed maternal history, history from birth up until the time of presentation to the ED, and a thorough family history.
- Any neonate aged ≤21 days who has a reported or measured temperature of ≥38°C, irrespective of the presence of skin findings, needs a complete infectious workup, defined as blood testing, urine testing, cerebral spinal fluid testing, and viral respiratory testing, if accessible.
- An unwell-appearing or febrile neonate with a blistering rash requires immediate attention, evaluation, and management for serious infection, including blood work and antimicrobial therapy to cover for multiple potential invasive pathogens.
- For all blistering skin lesions with vesicles and/or pustules, cultures and polymerase chain reaction (PCR) testing (bacterial and viral, respectively) of the lesion should be collected as indicated for the suspected differential diagnosis based on clinical presentation and morphology.
- If HSV infection is suspected, PCR (or culture if PCR is not available) from skin lesion(s) should be sent along with blood work, including serum HSV PCR, liver function tests, and coagulation studies. Treatment with parenteral acyclovir should be initiated immediately for any neonate with vesicular skin lesions for which HSV is being considered.
- SSSS should be considered in the presence of irritability, skin erythema, skin tenderness, blister formation, or desquamation. SSSS should be treated early with penicillinase-resistant penicillins, such as nafcillin or oxacillin; alternatives include a first- or second-generation cephalosporin. If there is a concern for MRSA, vancomycin should be used instead.
- An uncommon but concerning cause of peeling skin in the neonate is congenital syphilis. Neonates with signs and symptoms concerning for congenital syphilis should be admitted to the hospital for full evaluation and treatment.
- When considering neonatal systemic lupus erythematosus, it is important to obtain serologies including Ro and La antibodies, liver function tests, and coagulation studies, as well as measuring head circumference (due to the association with hydrocephalus).
- Candidal infections should be considered if the rash appears fleshy red with surrounding satellite lesions. In contrast to contact diaper dermatitis, candidal diaper rash involves the skin folds. When a strong clinical suspicion exists for candidal diaper dermatitis, topical antifungal therapy should be initiated.
- An infantile hemangioma in the diaper area requires prompt evaluation and management by a dermatologist. Wound cultures should be obtained, empiric topical antibiotics started, and protective dressing care should be considered.
- Consider underlying systemic diseases for a chronic or recalcitrant diaper rash that has failed traditional methods of treatment.

Pearls

- Common categories of neonatal skin conditions that include diagnoses with the potential for harmful outcomes include: (1) vesicles, pustules, and bullae; (2) erythroderma with or without desquamation; (3) eczematous rashes; and (4) diaper dermatitis.
- When considering a rash in the neonate, categorize the rash and further delineate a differential diagnosis within each of these categories. **(See Table 1.)** This approach helps to determine whether the presentation and physical examination have features of high-risk rashes.
- Photos documenting skin findings in the patient's medical record can be helpful, not only for acute ED presentations, but also for consulting services, to evaluate and check the progression of the condition.