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### Contributor Disclosures

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**INTRODUCTION** — Diaper dermatitis, also called diaper rash, napkin dermatitis, and nappy rash, is the most common skin eruption in infants and toddlers [1-3]. It typically occurs on convex skin surfaces that are in direct contact with the diaper, including the buttocks, lower abdomen, genitalia, and upper thighs ([figure 1](#)).

Although in most cases diaper dermatitis is a form of irritant contact dermatitis, eruptions in the diaper area may represent exacerbations of more diffuse skin diseases, such as seborrheic dermatitis or atopic dermatitis, or may be the manifestation of unrelated skin conditions that coincidentally manifest in the diaper area ([table 1](#)) [3,4].

The clinical features, diagnosis, treatment, and prevention of irritant diaper dermatitis will be reviewed here. Contact dermatitis in children is discussed separately. (See "[Contact dermatitis in children](#)".)

**EPIDEMIOLOGY** — The reported incidence and age of onset of diaper dermatitis vary worldwide, in relation to differences in diaper use, toilet training, hygiene, and child-rearing practices in different countries [5-9]. In the United States, dermatitis of the diaper area represents 10 to 20 percent of all skin disorders evaluated by the general pediatrician [5,6,9].

According to the 1990-1997 National Ambulatory Medical Care Survey, there were 8.2 million pediatric visits for diaper dermatitis, and the calculated risk of developing diaper dermatitis throughout childhood was one in four [6]. In infants, the estimated prevalence of diaper dermatitis ranges from 7 to 35 percent [6]. Diaper dermatitis can develop as early as one week of age, but the peak incidence occurs between 9 and 12 months [10,11].

**PATHOGENESIS** — Several factors concur in the pathogenesis of diaper dermatitis. They include excessive moisture, friction, increased pH, and high enzymatic activity, all of which contribute to the local disruption of the skin barrier function [12-14]. The normal acidic pH of the stratum corneum ("acid mantle") has an important role in the formation and maintenance of the permeability barrier and in the antimicrobial defense [15].

The increased moisture in the diaper area due to a combination of the occlusive effect of the diaper with the presence of fecal and urinary waste leads to maceration of the skin and disruption of the stratum corneum [16-18]. Maceration increases the susceptibility to frictional damage from the diaper with further impairment of the skin barrier function [3,12,19,20]. An altered skin barrier then permits increased permeation of chemical irritants and microorganisms [12,17,19,21].

The primary chemical irritants in the diaper area are derived from the synergistic action of urine and stool [22,23]. Fecal bacteria produce the enzyme urease, which interacts with urine to increase the pH level beneath the diaper [22]. Elevated pH levels activate fecal enzymes (protease and lipase) that directly irritate and damage the skin, causing an inflammatory skin reaction [23]. In addition, the elevated pH alters the cutaneous microbiome, making the skin more susceptible to colonization by organisms commonly found on the skin surface (eg, *Staphylococcus aureus*, *Streptococcus pyogenes*) and organisms found in the stool, such as *Candida albicans* [21].

**RISK FACTORS** — A variety of factors may increase the risk of diaper dermatitis:

- Infants with diarrhea or chronic stooling have an increased risk of developing diaper dermatitis due to continuous local skin irritation [24,25].
- Dietary factors also may play a role. Breast-fed infants have a lower incidence of diaper dermatitis than formula-fed infants, possibly because breast-fed infants have lower stool pH [22].
- Recent use of broad-spectrum antibiotics may predispose infants to develop diaper dermatitis by increasing the risk of developing diarrhea and secondary yeast infections [26].

**CLINICAL FEATURES** — Irritant diaper dermatitis typically occurs on convex skin surfaces that are in direct contact with the diaper (picture 1) [16,17]. These locations include the buttocks, lower abdomen, genitalia, and upper thighs (figure 1). The skin folds (areas not in direct contact with the diaper) are classically spared [9]. "Tidewater dermatitis" describes a pattern of erythema and scaling at the diaper margin due to friction and cycles of wetness and dryness in the affected areas [1,27].

The severity of irritant diaper dermatitis ranges from mild asymptomatic erythema to severe inflammation [2]:

- **Mild diaper dermatitis** – Mild diaper dermatitis is characterized by scattered erythematous papules or mild asymptomatic erythema over limited skin areas with minimal maceration and frictional irritation (picture 2).
- **Moderate diaper dermatitis** – Moderate diaper dermatitis is characterized by more extensive erythema with maceration or superficial erosions (picture 1). Pain and discomfort are associated symptoms.
- **Severe diaper dermatitis** – Severe diaper dermatitis is characterized by extensive erythema with a glossy appearance, painful erosions, papules, and nodules (picture 3A-B).

Rare presentations of severe chronic irritant diaper dermatitis in children usually older than six months and adults with urinary or fecal incontinence include [3,28]:

- **Jacquet's erosive diaper dermatitis** – Jacquet's erosive diaper dermatitis is characterized by well-demarcated papules, nodules, and punched-out ulcerations in the perineal region (picture 4) [29]. Factors contributing to the development of Jacquet's erosive dermatitis include urinary incontinence, infrequent diaper changing, and chronic stooling. Jacquet's diaper dermatitis usually is treated in the same manner as irritant diaper dermatitis [30]. (See '[Management](#)' below.)
- **Granuloma gluteale infantum** – Granuloma gluteale infantum presents with characteristic reddish-purple nodules in the inguinal folds, scrotum, buttocks, and medial thighs and is usually seen between two and nine months of age (picture 5) [31,32]. Numerous precipitating factors have been identified, including the use of high-potency topical corticosteroids and preexisting candidal infections [32,33]. Although granuloma gluteale infantum may clinically resemble a neoplastic process, it is considered a benign inflammatory dermatosis. Skin biopsy may help confirm the diagnosis. It may improve with the avoidance of inciting factors and aggressive barrier protection. (See '[Management](#)' below.)
- **Pseudoverrucous papules and nodules** – Pseudoverrucous papules and nodules present as multiple shiny, white-gray, wart-like papules and nodules on an erythematous background located in the genital area (picture 6) [34]. They have been reported in the peristomal area of patients with urostomy and in incontinent children and adults [35-40].

A newly described form of irritant diaper dermatitis presenting with vesiculobullous lesions associated with cloth diapers has been reported [41].

**Clinical course** — The course of diaper dermatitis is typically episodic. Each episode of mild to moderate diaper dermatitis treated with conventional therapies has an average duration of two to three days. Diaper

dermatitis that persists for more than three days despite standard treatment may be secondarily infected with *C. albicans*.

**Secondary infection** — If irritant dermatitis is left untreated for more than three days, it may become secondarily infected with microorganisms such as *C. albicans* or, less frequently, *S. aureus*, *S. pyogenes*, or herpes simplex virus [19.42].

- **Candidal infection** – *Candida* superinfection classically presents with beefy red plaques, satellite papules, and superficial pustules that leave a collarette of scale once ruptured (picture 7) [1]. In contrast to simple irritant diaper dermatitis, candidal infections commonly involve the skin folds (picture 8A-B). There also may be a history of diarrhea, recent antibiotic use, or oral thrush. Diagnosis usually is based on the clinical presentation, but may be confirmed by potassium hydroxide (KOH) preparation demonstrating pseudohyphae or by fungal culture (picture 9A-B).

Persistent candidal diaper rash in young children may be a sign of type 1 diabetes mellitus, chronic mucocutaneous candidiasis, or an underlying immune deficiency. (See "[Epidemiology, presentation, and diagnosis of type 1 diabetes mellitus in children and adolescents](#)" and "[Chronic mucocutaneous candidiasis](#)". section on 'Clinical features of AIRE deficiency/APECED'.)

- **Impetigo** – Secondary infection from *S. aureus* and, less frequently, from *S. pyogenes* also may develop in the diaper region. Hallmarks of impetigo include 1 to 2 mm fragile pustules and honey-colored, crusted erosions. Bullous impetigo describes large, flaccid, pus-filled bullae that tend to rupture easily, leaving erosions with a collarette of scale (picture 10A-B). Gram stain and bacterial culture of a pustule should be performed to confirm the diagnosis. (See "[Impetigo](#)".)

Young infants with bacterial diaper dermatitis may require additional evaluation for serious bacterial illness if they are febrile and/or ill-appearing (eg, lethargic, hypotonic, irritable). (See "[Febrile infant \(younger than 90 days of age\): Outpatient evaluation](#)" and "[Approach to the ill-appearing infant \(younger than 90 days of age\)](#)".)

- **Streptococcal perianal dermatitis** – Infants, preschool-, and school-aged children may develop perianal group A streptococcal infection (picture 11) [43,44]. Clinical features include a bright red, sharply demarcated perianal or perineal erythema, sometimes associated with perirectal fissures, blood-streaked stools, pruritus, and pain with defecation [43-47]. Some children present with intermittent episodes of irritability [48]. The patient and/or household contacts may have a history of recurrent streptococcal pharyngitis [46]. Treatment with antibiotics is required.
- **Herpes simplex virus infection** – Herpes simplex virus infection may manifest with vesicular, papular, or pustular lesions in the diaper area. Herpes simplex virus infection in the diaper area is a possible manifestation of child abuse. (See "[Clinical manifestations and diagnosis of herpes simplex virus type 1 infection](#)" and "[Evaluation of sexual abuse in children and adolescents](#)".)

**EVALUATION** — The evaluation of the child with skin inflammation involving the diaper area is focused on determining whether the eruption is a typical irritant contact dermatitis, or the exacerbation of a more diffuse skin disease (eg, seborrheic dermatitis, atopic dermatitis), or the manifestation of unrelated skin conditions that coincidentally manifest in the diaper area (table 1) [3.4.49]. (See '[Differential diagnosis](#)' below.)

Aspects of the history that can help identify contributing factors and support or exclude non-diaper-associated dermatitis include [16.43.50.51]:

- Associated symptoms (eg, diarrhea).
- Systemic symptoms.
- Information about diapers and diapering: type of diaper, how often diapers are changed, method of laundering cloth diapers (if cloth diapers are used).

- Information about how the diaper area is cleansed (eg, soaps, cleansers, washcloths, wipes, etc).
- Exposure to contagious disease (eg, scabies, herpes simplex virus).
- Past history of dermatologic, allergic, or infectious illnesses.
- Family history (eg, psoriasis, atopy).
- Antibiotic use (predisposes to candidal dermatitis and diarrhea).
- Previous therapies that have been used for the diaper dermatitis. It may be helpful to have caregivers bring all of the products being used in the diaper area to the office, since some topical "home remedies" are toxic to infant skin or have the potential for systemic toxicity with percutaneous absorption (eg, boric acid, [camphor](#), phenol, salicylates, and baking soda). (See '[Harmful products](#)' below.)

Laboratory tests usually are not necessary in the evaluation of irritant diaper dermatitis. However, they may help confirm the etiology in atypical or recalcitrant cases [\[50.51\]](#):

- Potassium hydroxide (KOH) preparation and fungal culture of skin scrapings for *Candida* ([picture 9A-B](#)). (See "[Clinical manifestations and diagnosis of Candida infection in neonates](#)", section on '[Diagnosis](#)'.)
- [Mineral oil](#) slide preparation for scabies ([picture 12](#)). (See "[Scabies: Epidemiology, clinical features, and diagnosis](#)", section on '[Diagnosis](#)'.)
- Viral culture, polymerase chain reaction (PCR), direct fluorescent antibody (DFA), or Tzanck preparation for the diagnosis of herpes simplex virus. (See "[Clinical manifestations and diagnosis of herpes simplex virus type 1 infection](#)", section on '[Diagnosis](#)'.)
- Culture of skin lesions for *S. aureus* or group A *Streptococcus*. (See "[Suspected Staphylococcus aureus and streptococcal skin and soft tissue infections in children >28 days: Evaluation and management](#)", section on '[Laboratory evaluation](#)'.)

A skin biopsy may be necessary in cases in which the rash is atypical or unresponsive to conventional therapy.

**DIAGNOSIS** — The diagnosis of irritant diaper dermatitis is made clinically, based upon the presence of an erythematous eruption that involves the convex surfaces of buttocks and genital area. The sparing of the skin folds is characteristic of irritant diaper dermatitis, unless there is *Candida* superinfection.

## DIFFERENTIAL DIAGNOSIS

**Seborrheic dermatitis** — Seborrheic dermatitis is common during infancy. Clinical features include well-circumscribed erythematous papules and plaques with greasy yellow scale most prominent in the skin folds. In the diaper region, the inguinal creases are mainly involved ([picture 13](#)). Seborrheic dermatitis is rarely isolated to the diaper area. Most infants also have involvement of the scalp ("cradle cap"), face, neck, and other skin folds (axillae, antecubital fossa, and popliteal fossa) ([picture 14](#)). Seborrheic dermatitis usually responds to short-term topical therapy with low-potency corticosteroids or topical antifungal preparations. (See "[Cradle cap and seborrheic dermatitis in infants](#)".)

**Atopic dermatitis** — Atopic dermatitis usually spares the diaper area, since the diaper provides a moist environment that hydrates the underlying skin, preventing the development of eczematous dermatitis ([picture 15](#)). When the diaper area is affected by atopic dermatitis, signs of chronic scratching (eg, increase in skin lines and excoriations) may be observed. Atopic dermatitis usually is present elsewhere on the body, and there is typically a history of pruritus and a family history of atopy. (See "[Atopic dermatitis \(eczema\): Pathogenesis, clinical manifestations, and diagnosis](#)" and "[Treatment of atopic dermatitis \(eczema\)](#)".)

**Allergic contact dermatitis** — Allergic contact dermatitis is an uncommon cause of dermatitis of the diaper area. Diaper dyes and fragrances appear to be the sensitizing allergens in diapers [51,52]. Preservatives, fragrances, and additives in baby wipes and topical creams have also been implicated [51,53,54]. Heat and moisture associated with diaper use may facilitate allergen release and absorption into the skin. (See "[Management of allergic contact dermatitis](#)".)

**Psoriasis** — Psoriasis can appear at any age and may initially develop in the diaper area [55]. It usually presents with sharply demarcated erythematous scaly papules and plaques ([picture 16A-B](#)). Significant scale may be lacking in involved areas in the diaper region due to the presence of maceration and moisture beneath the diaper. There may be a family history of psoriasis. (See "[Epidemiology, clinical manifestations, and diagnosis of psoriasis](#)".)

**Scabies** — Scabies can involve the diaper region in infants ([picture 17](#)). An acute, widespread, pruritic dermatitis is the most common manifestation. Cutaneous findings include a widespread vesiculopapular eruption involving the trunk ([picture 18](#)), axillae ([picture 19](#)), neck, palms, and soles ([picture 20](#)). Other family members with similar lesions and a history of pruritus support the diagnosis. Diagnosis is confirmed by identifying a mite, egg, or stool on microscopic examination of a scraping from a lesion ([picture 12](#)). The diagnosis and treatment of scabies is discussed in detail separately. (See "[Scabies: Epidemiology, clinical features, and diagnosis](#)".)

**Langerhans cell histiocytosis** — Langerhans cell histiocytosis (LCH) is a potentially life-threatening hematologic/oncologic disorder that can present with severe or recalcitrant diaper dermatitis. The cutaneous lesions usually present during infancy or early childhood and consist of red/orange or yellow/brown scaly papules, erosions, or petechiae most commonly in the groin, intertriginous regions, and scalp ([picture 21A-B](#)).

LCH can resemble seborrheic dermatitis; however, the color of the lesions and presence of petechiae and erosions helps to differentiate between the two. In addition to the cutaneous findings, patients with LCH also may have bone lesions, lymphadenopathy, hepatosplenomegaly, and anemia. Skin biopsy is necessary to confirm the diagnosis. (See "[Clinical manifestations, pathologic features, and diagnosis of Langerhans cell histiocytosis](#)".)

**Child abuse** — Child abuse is an important consideration in severe, recalcitrant, or atypical diaper dermatitis. A severe diaper dermatitis that appears "resistant" to treatment may actually be the result of neglect by the parent or caregiver. The diaper area also is a possible site for scalds, burns, and bruises in abused children. Although infection with the human papilloma virus (condyloma acuminatum or genital warts) in the groin region can be acquired perinatally from an infected mother, sexual abuse also should be considered and addressed as a possible underlying cause. (See "[Child neglect and emotional maltreatment](#)" and "[Physical child abuse: Recognition](#)" and "[Evaluation of sexual abuse in children and adolescents](#)", section on 'Suspicious findings'.)

**Congenital syphilis** — The skin lesions of congenital syphilis may be present at or after birth [1,9]. They may be seen in the diaper area and/or around the mouth and nose and are characteristically copper-colored, scaly macules and papules or moist erosions ([picture 22](#)); perianal papular lesions (condyloma lata) also may be seen. The skin lesions contain spirochetes and are highly infectious. Other manifestations of congenital syphilis include symmetric desquamation of the palms and soles, anemia, hepatosplenomegaly, jaundice, and changes of the long bones. The diagnosis is confirmed with serology or dark field microscopy, if available. (See "[Congenital syphilis: Clinical features and diagnosis](#)", section on 'Clinical findings'.)

**Other** — Rarely, nutritional deficiencies and immunodeficiencies can present with recalcitrant diaper dermatitis. These include acrodermatitis enteropathica ([picture 23](#)), [biotin](#) deficiency, and cystic fibrosis (secondary to malabsorption) as well as many other uncommon disorders [1,4,56,57].



**MANAGEMENT** — In most cases, the management of diaper dermatitis involves general skin care measures (eg, frequent diaper changing, air exposure, gentle cleansing), choice of diapers, and use of topical barrier preparations [2]. Low-potency topical corticosteroids and antifungals may be used in severe cases and in cases complicated by *Candida* superinfection.

**Skin care of the diaper area** — Increasing the frequency of diaper changing and skin cleansing limits prolonged skin contact with stool and urine and therefore is an essential aspect of the management of diaper dermatitis [1,10]. If possible, an infant with irritant diaper dermatitis should be allowed periods of rest without a diaper (eg, a few hours per day), allowing the skin to be exposed directly to air [2,3].

The diaper area should be gently cleaned with warm water and a small amount of a mild cleansing product with physiologic pH. (See '[Cleansing](#)' below.)

As an alternative, fragrance-free and alcohol-free baby wipes can be used, but should be discontinued if the skin becomes irritated or broken down. Preservatives such as methylisothiazolinone in baby wipes may cause allergic contact dermatitis [54]. (See '[Allergic contact dermatitis](#)' above and "[Common allergens in allergic contact dermatitis](#)", section on '[Isothiazolinones](#)'.)

**Choice of diaper** — The best choice of diapers for use in infants is a controversial issue [58]. Disposable diapers have an absorbent gel core that can absorb up to 80 times its weight in water and have been designed specifically to mitigate factors that predispose to irritant diaper dermatitis [59-66]. However, a systematic review of studies evaluating whether disposable diapers prevent diaper dermatitis in children concluded that there was not enough evidence from good-quality randomized controlled trials to support or refute the use and type of disposable diapers to prevent diaper dermatitis in infants [58]. (See '[Type of diaper](#)' below.)

## Therapeutic options

**Barrier preparations** — Barrier preparations physically block chemical irritants and moisture from contacting the skin and minimize friction [17,67]. Pastes and ointments generally are better barriers than creams and lotions, which are poorly adherent, minimally occlusive, and may contain fragrances and preservatives [17,67].

The use of topical barrier ointments and pastes for the treatment of diaper dermatitis is based upon long-standing clinical experience. There are a few poor-quality randomized trials comparing these agents to placebo or to one another [67,68].

The most common over-the-counter topical barriers contain petrolatum, [zinc oxide](#), or both [1,16,19,43]. Some also contain [lanolin](#), paraffin, or dimethicone (a silicone oil) [43].

[Sucralfate](#), a prescription medication labeled for the treatment of duodenal ulcers in the United States, also acts as a physical barrier to irritants and has antibacterial activity. Topical application of sucralfate has been reported to be useful in the management of severe or recalcitrant irritant diaper dermatitis [69].

**Topical corticosteroids** — A low-potency topical corticosteroid can reduce the inflammation in diaper dermatitis that persists despite skin care measures and use of barrier preparations. The use of topical corticosteroids for diaper dermatitis has not been evaluated in randomized trials. Their use is based upon evidence of efficacy in other childhood inflammatory skin conditions and clinical experience. (See "[Cradle cap and seborrheic dermatitis in infants](#)", section on '[Nonscalp, nonintertriginous seborrheic dermatitis](#)'.)

The use of potent or fluorinated corticosteroids in the diaper area should be avoided, since the occlusion in the area promotes systemic absorption and may cause adrenal suppression and iatrogenic Cushing syndrome [70-74]. (See "[General principles of dermatologic therapy and topical corticosteroid use](#)", section on '[Use in children](#)'.)

**Antifungal agents** — Antifungal agents such as [nystatin](#), [clotrimazole](#), [miconazole](#), [ketoconazole](#), and [sertaconazole](#) are effective topical therapies for diaper dermatitis complicated by secondary *Candida* infection [75-78]. In a randomized trial, an antifungal paste containing clotrimazole was found to be superior to one with nystatin with respect to reduction in symptom score and global assessment of diaper dermatitis in infants [75]. However, microbiologic cure was achieved in 100 percent of cases with both agents.

Potential adverse effects of antifungals include irritation, burning, and itching.

**Other** — Breast milk is thought to have antiinflammatory and antimicrobial properties. In one study including 150 infants with mild to moderate diaper dermatitis, breast milk was as effective as 1% [hydrocortisone](#) cream in clearing the rash after seven days of treatment [79].

Another study compared breast milk with a zinc-oxide containing barrier cream in the treatment of moderate to severe diaper dermatitis in infants in the neonatal intensive care unit [80]. The time to improvement was similar in the two groups, although the clinical score was lower in the barrier cream group.

**Harmful products** — Use of powders such as cornstarch or talcum powder pose a significant respiratory risk if accidentally aspirated and therefore should be avoided [43,81]. Baking soda and boric acid powders also should be avoided because of the risk of systemic toxicity with percutaneous absorption [16,43,82,83].

Topical barriers or medications that contain fragrance, preservatives, and other ingredients with irritant or allergic potential (eg, [neomycin](#)) should be avoided [67]. Products containing boric acid, [camphor](#), phenol, [benzocaine](#), and salicylates also should be avoided because of the potential for systemic toxicity and/or methemoglobinemia [16,42,67,82,84-87]. These agents are contained in some commercially available products for diaper dermatitis. (See "[Genetics and pathogenesis of methemoglobinemia](#)", section on 'Infants and children'.)

## Approach to treatment

**Mild to moderate diaper dermatitis** — We suggest topical barrier preparations in the form of creams, ointments, or pastes as the first-line therapy for mild to moderate diaper dermatitis [16,67]. Topical barriers are applied with every diaper change; they should be applied thickly and can be covered with petroleum jelly to prevent sticking to the diaper [88].

**Severe diaper dermatitis** — We suggest low-potency, nonhalogenated topical corticosteroids (Group 7, (table 2)) such as 1% [hydrocortisone](#) for the treatment of severely inflamed irritant diaper dermatitis that does not respond to barrier products alone. Topical corticosteroids are applied twice a day for three to seven days concomitantly with barrier ointments [1,5,9,17,19]. Barrier products should be applied last.

**Candida superinfection** — We suggest antifungal agents for the treatment of diaper dermatitis in the following situations:

- There is clinical evidence of *Candida* superinfection (eg, beefy red plaques, satellite papules, superficial pustules; involvement of the skin folds) ([picture 8B-C](#))
- *Candida* superinfection has been confirmed by potassium hydroxide (KOH) preparation or fungal culture ([picture 9A-B](#))
- The dermatitis has been present for at least three days (which increases the likelihood of secondary infection with *Candida*)

Antifungal creams or ointments are applied to the diaper area beneath the barrier ointment two to three times a day until the rash has resolved.

Combination topical corticosteroids and antifungal creams such as [betamethasone](#) dipropionate and [clotrimazole](#) cream or [triamcinolone](#) acetonide and [nystatin](#) cream should **not** be used in the diaper area [6,7,89-91]. Both contain topical corticosteroids that are too potent for infant skin and may cause unwanted

corticosteroid side effects such as skin atrophy and adrenal suppression [6,90]. These combination creams also have been found to provide only temporary improvement [89,90].

**Bacterial superinfection** — If a secondary bacterial infection is present, topical or oral antibiotics may be necessary. If the bacterial infection is localized and mild, topical [mupirocin](#) applied twice a day for five to seven days may be sufficient to treat a staphylococcal infection. Oral antibiotics are indicated for more severe infections, including perianal streptococcal dermatitis [1,18,92]. (See '[Secondary infection](#)' above.)

Neosporin ointment should **not** be used because it contains [neomycin](#), a common inciting allergen for allergic contact dermatitis. Similarly, [bacitracin](#) ointment should be avoided. (See "[Common allergens in allergic contact dermatitis](#)", section on '[Antibiotics](#)'.)

Young infants with bacterial diaper dermatitis may require additional evaluation for serious bacterial illness, especially if they are febrile and/or ill-appearing (eg, lethargic, hypotonic, irritable). Such infants usually require hospital admission and initial therapy with parenteral antibiotics [92]. (See "[Febrile infant \(younger than 90 days of age\): Outpatient evaluation](#)" and "[Approach to the ill-appearing infant \(younger than 90 days of age\)](#)".)

**Refractory diaper dermatitis** — In children with recalcitrant diaper rash that does not resolve with standard treatment, non-diaper-associated causes of dermatitis or underlying conditions that predispose to diaper dermatitis must be considered [43]. Additional laboratory testing or a skin biopsy may be required for precise diagnosis. (See '[Differential diagnosis](#)' above.)

Among non-diaper-associated causes of dermatitis, Langerhans cell histiocytosis, infections, nutritional deficiencies, and child abuse or neglect are particularly important to remember. (See '[Evaluation](#)' above.)

Persistent candidal diaper rash in young children may be a sign of type 1 diabetes mellitus, chronic mucocutaneous candidiasis, or an underlying immune deficiency. (See "[Epidemiology, presentation, and diagnosis of type 1 diabetes mellitus in children and adolescents](#)" and "[Chronic mucocutaneous candidiasis](#)", section on '[Clinical features of AIRE deficiency/APECED](#)'.)

**PREVENTION** — There are no randomized trials evaluating the efficacy of specific skin care practices, including the use of barrier ointments, in the prevention of diaper dermatitis [93]. Based upon clinical experience, the most effective way to prevent irritant diaper dermatitis is to minimize direct skin contact with urine and feces by frequent diaper change and gentle cleansing of the diaper area [1,10,93-95].

**Type of diaper** — Although there is significant debate about the environmental impact of disposable versus cloth diapers, disposable diapers have been designed specifically to mitigate factors that predispose to irritant diaper dermatitis [66,96-98]. Disposable diapers have an absorbent gel core that can absorb up to 80 times its weight in water and outer layers that absorb liquids quickly and prevent liquid from leaking back out of the diaper on the skin [66,97,98]. However, a systematic review of studies evaluating whether disposable diapers prevent diaper dermatitis in children concluded that there was not enough evidence from good-quality randomized trials to support or refute the use and type of disposable diapers to prevent diaper dermatitis in infants [58].

Whether parents choose to use cloth or disposable diapers, frequent diaper changes help prevent irritant diaper dermatitis. During treatment of diaper dermatitis, disposable diapers may be preferred.

**Cleansing** — Overzealous cleansing can promote irritation and delay skin healing. Limited gentle cleansing with warm water and a soft cloth usually is sufficient [1]. If soaps are desired, mild fragrance-free liquid soaps may be used. If the diaper area is eroded, it may be irrigated with water from a plastic squeeze bottle or by squeezing a washcloth soaked in water [43,59]. Dried feces can be gently removed with [mineral oil](#) applied to a cotton ball [59]. It is not necessary to wipe off barrier paste completely at each diaper change, but when removal is required, mineral oil is helpful [43,59,67,88,99]. To avoid unnecessary friction, the diaper area should be dried by gently patting with a towel [43,67].



Fragrance-free and alcohol-free baby wipes can be used as an alternative to water and cloth, but should be discontinued if the skin becomes irritated or broken down. Infant wipes are widely used for practical reasons, although there is limited evidence from randomized trials that they are gentler than water for cleansing the diaper area [100-102]. Baby wipes containing the preservative methylisothiazolinone may cause allergic sensitization and should be avoided [54].

In a randomized trial including 280 healthy newborns, alcohol-free baby wipes were comparable to cotton wool and water in terms of skin hydration, skin surface pH, transepidermal water loss (TEWL), and density of microbial skin contaminants [100]. In a randomized study comparing wipes with water and cloth for skin cleansing in preterm and term neonatal intensive care unit (NICU) newborns, skin erythema, pH, and TEWL were lower in the wipes group than in the water and cloth group [101].

The United States Association of Women's Health, Obstetric and Neonatal Nurses recommend that detergent- and alcohol-free wipes may be used if a clean cloth and water are not available [103]. In contrast, the postnatal care guidelines of the [United Kingdom National Institute of Clinical Excellence](#) recommend the use of cotton wool and water and against the use of baby wipes for the cleansing of the diaper area.

**Education** — Educating parents and caregivers in ways of preventing and treating diaper dermatitis is of utmost importance. Providing educational materials/handouts can be helpful since it allows families to review the information again at home.

**INFORMATION FOR PATIENTS** — UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5<sup>th</sup> to 6<sup>th</sup> grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10<sup>th</sup> to 12<sup>th</sup> grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topics (see ["Patient education: Diaper rash \(The Basics\)"](#) and ["Patient education: Giving your child over-the-counter medicines \(The Basics\)"](#))
- Beyond the Basics topics (see ["Patient education: Diaper rash in infants and children \(Beyond the Basics\)"](#))

## SUMMARY AND RECOMMENDATIONS

- Diaper dermatitis, also called napkin dermatitis or nappy rash, is a form of irritant contact dermatitis occurring on the skin surfaces that are in direct contact with the diaper. However, eruptions in the diaper area may also be the manifestation of unrelated skin conditions that coincidentally manifest in the diaper area ([table 1](#)). (See ['Introduction'](#) above.)
- Characteristic features of irritant diaper dermatitis include involvement of the convex surfaces and sparing of the skin folds ([picture 1](#)), unless there is *Candida* superinfection ([picture 8B](#)). The lesions may vary from asymptomatic erythema to painful scaling papules and superficial erosions ([picture 3A](#)). Rare presentations of severe, chronic, irritant diaper dermatitis include Jacquet's erosive diaper dermatitis ([picture 4](#)), granuloma gluteale infantum ([picture 5](#)), and pseudoverrucous papules and nodules ([picture 6](#)). (See ['Clinical features'](#) above.)
- The diagnosis of irritant diaper dermatitis is clinical, based upon the presence of an erythematous eruption that involves the convex surfaces of the diaper area and spares the folds. Atypical-appearing

diaper rashes and those that fail to resolve with conventional treatment warrant additional evaluation. (See '[Diagnosis](#)' above and '[Differential diagnosis](#)' above.)

- We suggest topical barrier ointments as the first-line treatment for mild to moderate diaper dermatitis (**Grade 2C**). We suggest the addition of low-potency nonhalogenated topical corticosteroids such as 1% [hydrocortisone](#) for severely inflamed irritant diaper dermatitis (**Grade 2C**). (See '[Mild to moderate diaper dermatitis](#)' above and '[Severe diaper dermatitis](#)' above.)
- We suggest the addition of a topical antifungal agent in children in whom the diaper dermatitis appears to be or is confirmed to be complicated by *Candida* superinfection, or in whom the dermatitis has been present for at least three days (**Grade 2B**). We recommend **not** using combination topical corticosteroids and antifungal creams for the treatment of irritant diaper dermatitis (**Grade 1C**). (See '[Candida superinfection](#)' above.)
- We suggest that powders not be used for the treatment for irritant diaper dermatitis (**Grade 2C**). (See '[Harmful products](#)' above.)
- We suggest frequent diaper changes and gentle skin cleansing for the prevention of diaper dermatitis (**Grade 2C**). (See '[Prevention](#)' above.)

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