An Approach to Diaper Rash

Objectives:

1. Identify common diaper related causes of diaper dermatitis
2. Identify non-diaper associated causes of diaper dermatitis
3. Describe clinical features that can help differentiate more common causes of diaper dermatitis
4. Describe the role of investigations for the evaluation of diaper dermatitis
5. Describe management modalities for common causes of diaper dermatitis

Case presentation

You are working in a busy community outpatient clinic. Your first patient of the day is Mary, a 4 month-old baby girl, accompanied by her parents. They explain that the reason for their visit is that Mary has had a “diaper rash” for the past 2 weeks.

1) You proceed to complete a history for Mary’s presenting complaint. What relevant questions will you ask?

2) You recall your differential diagnosis of diaper dermatitis. You remember that there are DIAPER RELATED and NON-DIAPER RELATED causes that you must consider.

Table 1: Classification of diaper dermatitis

<table>
<thead>
<tr>
<th>Associated with Diaper Use</th>
<th>NOT Associated with Diaper Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irritant</td>
<td>Seborrheic dermatitis</td>
</tr>
<tr>
<td>Jacquet’s Erosive</td>
<td>Atopic dermatitis</td>
</tr>
<tr>
<td>Candidal dermatitis</td>
<td>Bacterial (impetigo, GAS, syphilis)</td>
</tr>
<tr>
<td>Allergic contact dermatitis</td>
<td>Scabies</td>
</tr>
<tr>
<td></td>
<td>Psoriasis</td>
</tr>
<tr>
<td></td>
<td>Langerhans cell histiocytosis (LCH)</td>
</tr>
<tr>
<td></td>
<td>Nutrient deficiency (zinc)</td>
</tr>
<tr>
<td></td>
<td>Inflicted injury</td>
</tr>
<tr>
<td>Name</td>
<td>Features</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Irritant</td>
<td>Convex regions of diaper → Erosions</td>
</tr>
<tr>
<td>Jacquet’s Erosive</td>
<td></td>
</tr>
<tr>
<td>Candidal dermatitis</td>
<td>Beefy red plaques, satellite papules; Convex + folds</td>
</tr>
<tr>
<td>Allergic contact dermatitis</td>
<td>Characteristic pattern; seems pruritic</td>
</tr>
<tr>
<td>Seborrheic dermatitis</td>
<td>Greasy yellow scales; folds; in other areas (i.e. scalp)</td>
</tr>
<tr>
<td>Atopic dermatitis</td>
<td>Most severe region OUTSIDE diaper line</td>
</tr>
<tr>
<td>GAS</td>
<td>Bright red, sharply demarcated perianal &amp; perineal</td>
</tr>
<tr>
<td>Psoriasis</td>
<td>Scale; convex + folds; in other areas; Fam Hx</td>
</tr>
<tr>
<td>LCH</td>
<td>Red-orange-yellow-brown papules, erosions, petechiae; folds; in other areas (i.e. scalp); systemic symptoms</td>
</tr>
<tr>
<td>Zinc (deficiency, acrodermatitis enteropathica)</td>
<td>Symmetric appearance; in other areas (i.e. perioral)</td>
</tr>
<tr>
<td>Inflicted injury</td>
<td>Burns, bruises, patterns; STIs</td>
</tr>
</tbody>
</table>

**Intertriginous**

**Irritant**
3) You flip through a dermatological atlas and are able to recognize the following diaper dermatoses.
4) You proceed to complete a focused physical examination for Mary’s presenting complaint. What features do you look for OUTSIDE of the diaper region?

5) Describe your management plan for Mary’s rash.

References

INTRODUCTION — Diaper dermatitis is a general term used to describe any inflammatory skin eruption that develops in the diaper-covered region. It is synonymous with diaper rash, napkin dermatitis, and nappy rash. Although there are several causes of diaper dermatitis (table 1), "generic" diaper dermatitis is most often considered an irritant contact dermatitis (eg, a rash that results from localized physical, chemical, or mechanical irritation). Diaper dermatitis usually affects infants and toddlers, although it can affect any individual who wears a diaper.

An overview of the epidemiology, causes, treatment, and prevention of diaper dermatitis will be reviewed here. Contact dermatitis in children is discussed separately. (See "Contact dermatitis in children".)

EPIDEMIOLOGY — Diaper dermatitis is one of the most common skin disorders of infants and children. The reported incidence and age of onset vary worldwide, related to differences in diaper use, toilet training, hygiene, and child-rearing practices in different countries [1-4]. In the United States, diaper dermatitis represents 10 to 20 percent of all skin disorders evaluated by the general pediatrician [1-3]. 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 [3]. In infants, the estimated prevalence of diaper dermatitis ranges from 7 to 35 percent [3]. Diaper dermatitis can develop as early as one week of age, but the peak incidence occurs between 9 and 12 months [5,6].
CAUSES — Diaper dermatitis is a general term that encompasses numerous skin conditions occurring in the diaper area (table 1). There are two major categories of diaper dermatitis [1]:

- Rashes associated with or worsened by the diaper
- Rashes that occur regardless of diaper use

**Diaper associated**

**Irritant dermatitis** — Irritant dermatitis is the most common form of dermatitis associated with diaper use [7]. Clinical manifestations range from asymptomatic erythema to painful scaling papules and superficial erosions (picture 1).

Irritant diaper dermatitis typically occurs on convex skin surfaces that are in direct contact with the diaper [8,9]. 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 [1]. "Tidewater dermatitis" describes erythema and scaling at the diaper margin due to friction and cycles of wetness and dryness in the affected areas [7,10]. Jacquet's erosive dermatitis and granuloma gluteale infantum are rare dermatoses that occur in the diaper area and likely represent the severe end of the spectrum of irritant diaper dermatitis [11,12].

**Candidal dermatitis** — If irritant dermatitis is left untreated for more than three days, it may become secondarily infected with microorganisms such as Candida albicans [16,17]. Candidal infections classically present with beefy red plaques, satellite papules, and superficial pustules that leave a collarette of scale once ruptured [7]. In contrast to irritant diaper dermatitis, candidal infections commonly involve the skin folds (picture 4A-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 preparation demonstrating pseudohyphae or by fungal culture (picture 5A-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.

**Allergic dermatitis** — Allergic contact dermatitis to allergens in the diaper, including dye, has been reported
Clinical features include well-demarcated erythema, papules with scale, vesicles, or erosions in the diaper region. "Lucky Luke" or "cowboy holster" dermatitis is a form of allergic contact dermatitis in the diaper region characterized by its pattern of involvement, which resembles a cowboy's gun belt with triangular erythema located beneath the side bands (used to secure the diaper) on the lateral buttocks, upper lateral thighs, and flanks. Allergic contact dermatitis due to diaper dye usually occurs in a distribution that corresponds to the distribution of dye in the diaper (eg, hips, buttocks, inguinal area, and/or suprapubic area). If allergic contact dermatitis is suspected, skin patch testing may aid in identifying the underlying etiologic agent. Allergic contact dermatitis in children is discussed separately. (See "Contact dermatitis in children".)

**Nondiaper associated**

**Seborrhea** — 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 (figure 2). In the diaper region, the inguinal creases are mainly involved. 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). Seborrheic dermatitis usually responds to short-term topical therapy with low-potency corticosteroids. (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. 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 "Epidemiology, clinical manifestations, and diagnosis of atopic dermatitis (eczema)" and "Treatment of atopic dermatitis (eczema)".)

**Bacterial infection**

**Impetigo** — Impetigo (secondary bacterial infection) also may develop in the diaper region. Hallmarks of
Impetigo includes 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. Impetigo usually is caused by Staphylococcus aureus with or without group A streptococcal coinfection. Gram stain and bacterial culture of a pustule should be performed to confirm the diagnosis.

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).

**Group A streptococcal infection** — Infants, preschool, and school-aged children may develop perianal GAS infection [22,23]. Clinical features include a bright red, sharply demarcated perianal or perineal rash, sometimes associated with perirectal fissures, blood-streaked stools, pruritus, and pain with defecation [22-25]. Some children present with intermittent episodes of irritability [26]. The patient and/or household contacts may have a history of recurrent streptococcal pharyngitis [25]. Treatment with antibiotics is required to improve the dermatitis.

**Herpes virus infection** — Herpes simplex virus infections 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.

**Psoriasis** — Psoriasis can appear at any age and may initially develop in the diaper area [27]. It usually presents with sharply demarcated erythematous scaly papules and plaques. 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.

**Scabies** — Scabies can involve the diaper region in young infants. An acute, widespread, pruritic dermatitis is the most common manifestation. Cutaneous findings include erythematous papules, nodules, and excoriations predominantly on the abdomen, web spaces of the hands and feet, axilla, and genitalia. 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 6). The diagnosis and treatment of scabies is discussed in detail separately.

**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 7A-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.

**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 [28].

**Congenital syphilis** — The skin lesions of congenital syphilis may be present at or after birth [1,7]. 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; 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.

**Other causes** — Rarely, nutritional deficiencies and immunodeficiencies can present with recalcitrant diaper dermatitis. These include acrodermatitis enteropathica (picture 8), biotin deficiency, and cystic fibrosis (secondary to malabsorption) as well as many other uncommon disorders [7,29,30].
IRRITANT DIAPER DERMATITIS

Pathogenesis — The interaction of many inciting factors, including increased skin hydration, exposure to chemical irritants, and friction beneath the diaper, contributes to the pathogenesis of irritant diaper dermatitis [8,9,11].

Increased skin hydration develops in the diaper region because it is an occluded, moist environment. The wetness of the skin beneath the diaper increases the susceptibility to frictional damage from the diaper, which impairs normal skin barrier function [16,31,32]. An altered skin barrier then permits increased permeation of chemical irritants and microorganisms [9,16,32,33].

The primary chemical irritants in the diaper area are derived from the synergistic action of urine and stool [34,35]. Fecal bacteria produce the enzyme urease, which interacts with urine to increase the pH level beneath the diaper [34]. Elevated pH levels activate fecal enzymes (protease and lipase) that directly irritate and damage the skin, causing an inflammatory skin eruption [35]. Once the skin beneath the diaper is inflamed, microorganisms (mainly Candida albicans) are able to invade and colonize, often worsening the severity of the diaper dermatitis [33].

A variety of factors may aggravate diaper dermatitis:
● Infants with diarrhea or chronic stooling have an increased risk of developing diaper dermatitis due to continuous local skin irritation [8].

● 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 [34].

● Recent use of broad-spectrum antibiotics may predispose infants to develop diaper dermatitis by increasing the risk of developing diarrhea and secondary yeast infections [36].

Clinical features — Clinical manifestations of irritant diaper dermatitis range from asymptomatic erythema to painful scaling papules and superficial erosions. Irritant diaper dermatitis typically occurs on convex skin
surfaces that are in direct contact with the diaper [8,9]. These locations include the buttocks, lower abdomen, genitalia, and upper thighs. The skin folds (areas not in direct contact with the diaper) are classically spared [1].

**Evaluation** — Evaluation of diaper dermatitis is focused on determining the underlying cause since the treatment varies accordingly. Atypical-appearing rashes and those that fail to resolve with conventional treatment warrant additional evaluation [8,37]. (See 'Nondiaper associated' above.)

Aspects of the history that can help identify contributing factors and support or exclude nondiaper-associated dermatitis include [8,22,38]:

- Associated symptoms (eg, diarrhea).
- Systemic symptoms (may suggest nondiaper-associated dermatitis, particularly LCH).
- 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, Staphylococcus aureus, group A Streptococcus).
- Past history of dermatologic, allergic, or infectious illnesses.
- Family history (eg, psoriasis, atopy).
- Antibiotic use (predisposes to candidal dermatitis and diarrhea).
- 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).

Certain aspects of the examination, particularly the distribution of the rash and morphology of the lesions, help determine the etiology (table 2) [8,37].

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 [38]:
- Potassium hydroxide preparation and/or fungal culture of skin scrapings for Candida (picture 5A-B)
- Mineral oil slide preparation for scabies (picture 6)
- Tzanck smear of blisters or pustules; multinucleated giant cells indicate a viral infection such as herpes simplex
- Serum zinc level for acrodermatitis enteropathica
- Culture of skin lesions for S. aureus or group A streptococcus
- Skin biopsy in cases in which the rash is atypical or unresponsive to therapy (for LCH, granuloma gluteale infantum)

Diagnosis — The diagnosis of irritant diaper dermatitis is made clinically. Characteristic findings include involvement of the convex surfaces and sparing of the skin folds (unless there is Candidal superinfection). The lesions may vary from asymptomatic erythema to painful scaling papules and superficial erosions. (See 'Irritant dermatitis' above.)

Management — The most effective way to treat irritant diaper dermatitis is to eliminate direct skin contact with urine and feces (ie, by discontinuing or limiting the use of diapers). If possible, an infant with irritant diaper dermatitis should be allowed periods of rest without a diaper, allowing the skin to be exposed directly to air [8]. Frequent diaper changes limit prolonged skin contact with stool and urine [5,7].

Topical barriers — Topical barriers in the form of ointments or pastes are considered first-line therapy for treating and preventing irritant diaper dermatitis [8,39]. 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 [40]. The use of topical barrier ointments and pastes for the treatment of diaper dermatitis is based upon long-standing clinical experience; there are few randomized controlled trials comparing these agents to placebo or to one another [39,41].

Topical barriers physically block chemical irritants and moisture from contacting the skin; they also minimize friction [9,39]. Topical barriers should be long-lasting and adherent to macerated and eroded skin. Pastes and
ointments generally are better barriers than creams and lotions, which are poorly adherent, minimally occlusive, and contain preservatives [9,39].

The most common over-the-counter topical barriers contain petrolatum, zinc oxide, or both (examples include Desitin, Triple Paste, A & D Ointment, and Balmex) [7,8,16,22]. Some also contain lanolin, paraffin, or dimethicone (a silicone oil) [22].

● White petrolatum (Vaseline) is an inexpensive, hypoallergenic product that physically protects the skin.

● Zinc oxide cream, ointment, or paste is also inexpensive and provides an impermeable barrier to irritants.

● 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 [42].

Topical barriers or medications that contain fragrance, preservatives, and other ingredients with irritant or allergenic potential (eg, neomycin) should be avoided [39]. Products containing boric acid, camphor, phenol, benzocaine, and salicylates also should be avoided because of the potential for systemic toxicity and/or methemoglobinemia [8,17,39,43-47]. These agents are contained in some commercially available products for diaper dermatitis.

Powders — Use of powders such as cornstarch or talcum powder is controversial. Powders can reduce friction and moisture and may be helpful in treating mild irritant diaper dermatitis; however, they pose a significant respiratory risk if accidentally aspirated and therefore are not suggested as first-line therapy [22,48]. Baking soda and boric acid powders also should be avoided because of the risk of systemic toxicity with percutaneous absorption [8,22,44,49].

Antifungal agents — Antifungal agents such as nystatin, clotrimazole, miconazole, and ketoconazole are effective topical therapies for candidal diaper dermatitis [50]. Antifungal agents are indicated when [1,16,17]:
● The dermatitis appears to be candidal (eg, beefy red plaques, satellite papules, superficial pustules; involvement of the skin folds) (picture 4A-B).

● Is confirmed to be candida by potassium hydroxide preparation or fungal culture (picture 5A-B).

● The dermatitis has been present for at least three days (which increases the likelihood of secondary superinfection with candida).

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

**Corticosteroids** — Low-potency nonhalogenated topical corticosteroids (Class VII, eg, 1 percent hydrocortisone) may be used sparingly and cautiously for brief periods of time (ie, three to five days) to treat severely inflamed irritant diaper dermatitis. Low-potency topical corticosteroids can be applied concomitantly with barrier ointments or antimicrobial agents, including antifungal agents [1,2,7,9,16]. When applying several topical agents, the barrier should be applied last. Since diapered skin is occluded, topical corticosteroids are absorbed more readily, and prolonged use is not recommended. Only the lowest potency, nonhalogenated topical corticosteroids should be prescribed; over-the-counter hydrocortisone 1 percent cream or ointment is often sufficient.

Topical corticosteroids are applied twice daily for a maximum of one week’s duration. Extreme caution must be used when prescribing topical corticosteroids, and if a higher potency or longer duration is required, supervision by an experienced dermatologist is recommended. Combination topical corticosteroids and antifungal creams such as betamethasone dipropionate and clotrimazole cream (Lotrisone) and triamcinolone acetonide and nystatin cream (Mycolog II) should NOT be used in the diaper area [3,4,51,52]. 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 [3,52]. These combination creams also have been found to provide only temporary improvement [51,52].
**Antibiotics** — If a secondary bacterial infection is present, topical or oral antibiotics are necessary depending upon the age of the patient. If the bacterial infection is localized and mild, mupirocin applied topically twice a day may be sufficient to treat a staphylococcal infection; however, oral antibiotics may be necessary if the infection is moderate or severe [7,11,53]. Neosporin ointment should be avoided because it contains neomycin, a common inciting allergen for allergic contact dermatitis. Similarly, Bacitracin ointment should be avoided. 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/or initial therapy with parenteral antibiotics [53].

**Refractory dermatitis** — When diaper rash does not resolve with minimizing precipitating factors and treatment, nondiaper-associated causes of dermatitis and underlying conditions that predispose to diaper dermatitis must be considered (eg, immunodeficiency) [22]. Among nondiaper-associated causes of dermatitis, LCH, infections, nutritional deficiencies, and child abuse or neglect are particularly important to remember.

Persistent candidal diaper rash in young children may be a sign of type 1 diabetes mellitus, chronic mucocutaneous candidiasis, or an underlying immune deficiency.

**Prevention** — The most effective way to treat irritant diaper dermatitis is to eliminate direct skin contact with urine and feces (ie, by discontinuing or limiting the use of diapers). However, in today’s society, diapers are necessary to limit fecal contamination and the spread of enteric diseases [11]. Changing diapers frequently limits prolonged skin contact with stool and urine and helps prevent diaper dermatitis [5,7,37].

**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 [54-60]. Disposable diapers have an absorbent gel core that can absorb up to 80 times its weight in water [7,56]. This decreases exposure of the skin to increased wetness and chemical irritants [55]. 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 [61]. 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 [7]. If soaps are desired, mild soaps such as fragrance-free Dove or Cetaphil cleanser 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 [22,54]. Dried feces can be removed with mineral oil applied to a cotton ball [54]. It is not necessary to wipe off barrier paste completely at each diaper change, but when removal is required, mineral oil is helpful [22,39,40,54,62]. To avoid unnecessary friction, the diaper area should be dried by gently patting with a towel [22,39]. In the United States, baby wipes are a common household item; however, overuse of baby wipes also may cause an irritant dermatitis [2,4,16]. Fragrance-free and alcohol-free baby wipes can be used sparingly but should be discontinued if the skin becomes irritated or broken down.

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

**SUMMARY AND RECOMMENDATIONS**

● Diaper dermatitis is a general term that encompasses numerous skin conditions occurring in the diaper area (table 1). (See 'Causes' above.)

● Evaluation of diaper dermatitis is focused on determining the underlying cause since the treatment varies accordingly. Atypical-appearing diaper rashes and those that fail to resolve with conventional treatment warrant additional evaluation. (See 'Evaluation' above and 'Nondiaper associated' above.)
● Characteristic features of irritant diaper dermatitis include involvement of the convex surfaces and sparing of the skin folds (unless there is candidal superinfection). The lesions may vary from asymptomatic erythema to painful scaling papules and superficial erosions. (See 'Diagnosis' above.)

● We suggest topical barrier ointments as the first-line treatment for irritant diaper dermatitis (Grade 2C). (See 'Topical barriers' above.)

● We suggest that powders not be used as first-line treatment for irritant diaper dermatitis (Grade 2C). (See 'Powders' 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 candidal, and in whom the dermatitis has been present for at least three days (Grade 2B). (See 'Antifungal agents' above.)

● We suggest the addition of low-potency nonhalogenated topical corticosteroids (Class VII, eg, 1 percent hydrocortisone) for severely inflamed irritant diaper dermatitis (Grade 2C). Low-potency topical corticosteroids should be applied sparingly to affected areas twice per day for a maximum of seven days; they may be used in conjunction with barrier ointments or antimicrobial agents. (See 'Corticosteroids' above.)

● We recommend NOT using combination topical corticosteroids and antifungal creams for the treatment of irritant diaper dermatitis (Grade 1C). (See 'Corticosteroids' above.)

● We suggest frequent diaper changes for the prevention of diaper dermatitis (Grade 2C). (See 'Prevention' above.)