# Nappy rash

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**Simple measures can be taken to treat eruptions and prevent recurrences of nappy rash, one of the most common dermatological conditions in childhood. Investigations may be required to ensure the rash is not a presentation of a more serious condition.**

Nappy rash most often affects babies who are in nappies at all times. However, older children with enuresis who still wear night nappies and incontinent adults who wear pads and absorbent underwear may also experience nappy rash.

## What causes nappy rash?

The cause of an eruption under a nappy is very often multifactorial. An eruption is due to an irritant dermatitis often coupled with superinfection and aggravation by a variety of topical treatments.

**IN SUMMARY**

- **The most common causes of nappy rash are overhydration, heat and friction under the nappy.**
- ***Candida albicans* usually colonises nappy rash and antifungal creams improve outcome.**
- **Some rare but serious conditions can present as nappy rash unresponsive to treatment.**
- **Nappy rash can ulcerate. This is not a sinister sign and the ulceration improves with the usual nappy rash treatment.**
- **When nappy rash involves the flexures, the presence of an underlying dermatosis such as psoriasis should be considered.**
- **Seborrhoeic dermatitis is common in young babies, and looks much worse than it is.**
- **Any persistent perianal rash should be cultured for the presence of beta-haemolytic Group A streptococci.**
- **A pustular rash under the nappy may be due to *Staphylococcus aureus*.**
- **Most parents are very concerned about the use of topical corticosteroids, and will need firm reassurance that corticosteroids are a safe, appropriate treatment for this condition.**

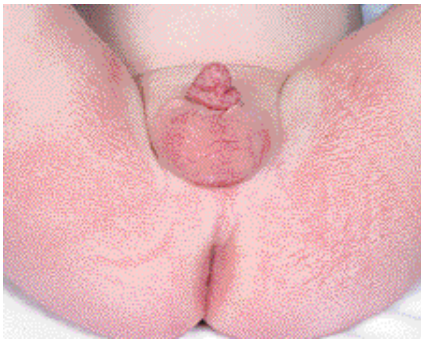

Figure 1. Irritant nappy rash.

Figure 2. Eroded nappy rash.

### Loss of barrier function

It was once believed that ammonia in urine was the cause of nappy rash, and in early textbooks it was termed 'ammoniacal dermatitis'. However, this has been disproved. It is now accepted that overhydration of skin under the nappy is the most likely basis for nappy rash. Increased skin hydration predisposes a child to injury from friction and increased susceptibility to irritants and micro-organisms.

Some children are more prone to nappy rash than others. Published studies have shown that in children from birth to 2 years of age, those under 12 months of age have the greater incidence of nappy rash. However, older children and adults who wear nappies or pads can have substantial problems with the skin under the nappy.

### Faeces and urine

Pancreatic and bacterial enzymes found in faeces are undoubtedly skin irritants. Bottle-fed babies may be more prone to nappy rash than breastfed babies because of an increase in enzyme-producing bacteria. Normal newborn infant skin has a slightly acidic pH. The surface pH of the skin covered by the nappy is higher than in other areas and this is increased by occlusion from the nappy as well as faecal bacteria.

### Irritating substances

The same substances that tend to aggravate dermatitis often play a role in nappy rash. These include bubble baths and soaps. Most parents start treating nappy rash themselves with over-the-counter barrier creams and medications from the pharmacist.

A recent study has found that nappy rash creams could predispose babies to nappy rash.[1] The effects of these creams may not always be helpful and may complicate the clinical picture because of increased redness and irritation. True contact allergy is unusual in babies, but is seen in older children and adults. Commercial wet wipes commonly contain perfumed products that are also irritating.

### Nappies

Considering the importance of maceration, heat and friction as causes of nappy rash, it is easy to appreciate that the use of cloth nappies usually causes more problems than the use of disposable nappies. Cloth nappies are usually used with nappy liners, plastic pants and overpants, all of which contribute to nappy rash. Many studies have demonstrated that the introduction of absorbent gel materials in good-quality disposable nappies has led to a decrease in the incidence of nappy rash.

### Underlying dermatological conditions

Some children who have no other skin problems seem to have a tendency to develop nappy rash. Although some research suggests that atopic dermatitis may present as a rash in the nappy area, such rashes are in fact uncommon in babies with atopic dermatitis and dry skin, where the nappy area may be the only part spared because of increased hydration. By contrast, older children with atopic dermatitis are often irritated by night nappies.

There are several dermatoses that may present as nappy rashes. Rarely, severe systemic diseases may present in this way. These are considered in more detail later in this article.

### *Candida albicans* and other infections

The presence of *Candida albicans* plays an important role in the development of nappy rash. *C. albicans* is frequently isolated from macerated genital skin in babies and adults, although not in prepubertal children. There is a correlation between the severity of nappy rash and levels of *C. albicans* in faeces and in cultures from the genital skin and mouth. *Candida* is more often a colonist that aggravates an underlying dermatitis than a true pathogen, although it can certainly occur as a true pathogen.

Candidal nappy rash presents with a very inflammatory rash that involves the flexures and is classically surrounded by satellite pustules.

It is uncommon for infections from other micro-organisms to cause nappy rash, but *Staphylococcus aureus* may cause folliculitis or impetigo of the nappy area. Group A beta-haemolytic *Streptococcus pyogenes* may cause a persistent perianal rash and sometimes acute vulvitis or balanitis. Herpes simplex virus may cause a very painful ulcerated rash. Dermatophyte infections can occur, often causing nonspecific but difficult to treat rashes. Rarely, babies with congenital syphilis may present with a nappy rash.

### Diarrhoea due to various causes

Children with diarrhoea often develop acute episodes of nappy rash. Although

many parents attribute nappy rash to teething, there is no evidence supporting a direct association. Infants who are teething may experience increased drooling and diarrhoea, and the diarrhoea may temporarily aggravate a child's tendency to develop nappy rash. Viral gastroenteritis with diarrhoea may also aggravate nappy rash.

## Clinical presentation and diagnosis

### Irritant (flexural sparing) nappy rash

Irritant nappy rash is the most common form of nappy rash, and is most often seen between the ages of 1 and 12 months. The usual clinical features of irritant nappy rash are confluent erythema and scaling of the convex surfaces that come into contact with the nappy (Figure 1). The groin flexures are typically normal ('flexural sparing'). In some children, the rash occurs only at the margins of the nappy around the waist and thighs where most friction is encountered. Particularly in young babies, the rash may be confined to the perianal area.

Irritant nappy rash is a dermatitis and shows the characteristic signs of erythema, scale and weeping. As the problem becomes more severe, erosions and ulcers may occur and the appearance may become quite alarming (Figure 2), raising the possibility of herpetic ulceration or even child abuse. The baby is often distressed by bathing and passing urine. Acute retention of urine may occur.

If the rash is longstanding, lichenification may occur. In the healing phase, desquamation is common.

#### Nappy rash in the older child

The clinical presentation of nappy rash in the older child differs from the classic rash seen in babies. The rash in the older child is not usually acutely inflamed, but presents as a low-grade dermatitis, often with miliaria or folliculitis on the buttocks. Friction lines at the edge of the nappy are often involved.

Figure 3. Acute candidiasis.

Figure 4. Seborrhoeic dermatitis.

#### 'Nappy' rashes in incontinent adults

'Nappy' rashes in incontinent adults present as persistent, low-grade dermatitis of the vulva or balanitis or erythema of the scrotum and adjacent groin, which seem resistant to treatment. Adults are often embarrassed by incontinence and do not volunteer during history taking that they wear absorbent underwear. On examination, the skin is often macerated. In immobile, incontinent people in nursing homes, this can be an intractable problem. Candidal and staphylococcal superinfection is common.

### Miliaria

Miliaria, a very common condition in babies, is also known as heat rash. It results from mild inflammation around sweat gland orifices due to sweat retention when the baby is hot because of hot weather, excessive clothing or fever. Miliaria may complicate or predominate in any case of nappy rash. The eruption, which is usually asymptomatic, consists of tiny vesicles or pustules on an erythematous base. Miliaria is harmless but can cause diagnostic confusion, particularly with folliculitis. It is self-limiting and responds to any measure that diminishes overheating.

### Rashes that involve the flexures

When rashes are due to underlying dermatoses or infection, rather than irritation to the skin from the nappy, the typical sparing of the groin folds is lost. There are so many causes that loss of flexural sparing is only a diagnostic clue insofar as it indicates that something more than common irritant nappy rash is occurring.

#### Acute candidiasis

Most nappy rashes are colonised by the yeast *C. albicans* and respond better to treatment that includes an antifungal agent. However, *Candida* may become a true pathogen, often for no apparent reason. In this situation, the rash involves the flexures, often becomes much more inflammatory and is surrounded by small peripheral pustules or 'satellite lesions' (Figure 3). The infection is easily proven with a swab for microscopy and bacterial culture (which is able to detect *C. albicans*).

#### Infantile seborrhoeic dermatitis

Infantile seborrhoeic dermatitis is a relatively common skin condition of small babies that usually involves the nappy area but often other parts of the skin as well. The onset is usually in the first two months of life. The first areas involved are the nappy area, face and scalp. The eruption may then generalise, involving the axillae, umbilicus and neck. Discoid lesions may involve the skin of the trunk.

The rash is erythematous and scaly (Figure 4). The scale tends to have a greasy feel in hairy areas. Although the

Figure 5. Napkin psoriasis.

Figure 6. Folliculitis.

rash may look quite dramatic, the baby is well and not distressed or itchy.

The long-term prognosis of children with infantile seborrhoeic dermatitis is variable, and it is important not to prognosticate too soon. Studies have shown that about half the cases have an idiopathic condition that is self-limiting, resolving by about 4 months of age. Simple dermatitis treatment is all that is needed.

However, seborrhoeic dermatitis may also be the first sign of either psoriasis or atopic dermatitis. If the rash persists, these diagnoses should be considered. Eventually the true nature of the child's problem will declare itself.

### Napkin psoriasis

When psoriasis appears for the first time in infancy it usually localises to the nappy area, scalp, face and around the ears. The onset of the eruption may be quite acute, and the rash may rapidly generalise to involve other parts of the skin. The appearance may be indistinguishable from seborrhoeic dermatitis, but it may also be typical of psoriasis, with bright pink plaques and dry white scales.

In the nappy area, psoriasis appears as bright red, glazed, slightly raised plaques (Figure 5). The pattern is bilaterally symmetrical and the flexures are involved. There is little or no scale. Sometimes the whole area in contact with the nappy is persistently red.

There is often a family history of psoriasis. Clues to the diagnosis include cradle cap, postauricular rashes and nail changes (such as pitting).

### Contact dermatitis

Most nappy rashes are a form of irritant contact dermatitis. True allergic contact dermatitis is unusual under nappies, partly because infants are too young to have been sensitised; however, it is becoming more common. Potential allergens are most often over-the-counter medications, antifungal creams, fragrances and preservatives in baby wipes, and latex gloves. Occasionally, allergens such as dyes and other chemicals in the disposable nappy itself seem to cause a problem. This has been reported under the title 'diaper dye dermatitis' and the allergen has been identified as blue, pink and green dyes in the nappy.

Another form of contact dermatitis from nappies has been termed 'lucky Luke dermatitis'. The clinical picture is of a rash located in the area where the nappy tabs make contact with the skin on the hips and buttocks, the so-called 'cowboy's gunbelt holsters' pattern, which prompted the name. The allergen is rubber additives found in the stretchy elasticated parts of the nappy.

Irritancy from applied substances is much more common. Potential irritants include wet wipes, soaps, shampoos, bubble baths, creams and even substances that the carer has applied to his or her hands.

Allergic contact dermatitis presents with a dramatic weeping, eroded rash. However, irritant contact dermatitis simply presents as a worsening of previous nappy rash or lack of response to treatment.

## Other infections of the nappy area

### Staphylococcal folliculitis

*S. aureus* is the most common bacterium to cause skin infections. Although it is much less common as a cause of infectious nappy rash than *C. albicans,* it may be responsible for folliculitis and impetigo in this area.

Folliculitis presents with multiple pustules, usually on the buttocks, but these can occur anywhere under the nappy (Figure 6). The rash may wax and wane, but there are usually a few lesions present. It tends to be itchy rather than tender, and the child is well. The diagnosis is easily confirmed on culture.

Staphylococcal folliculitis can look very similar to the satellite pustules of candidiasis. The difference is that in folliculitis all the lesions are pustules, whereas in candidiasis the pustules are usually seen on the edge of a zone of solid erythema.

### Impetigo

Bullous impetigo may occur in the nappy area. The eruption consists of thin-walled blisters that erode to leave moist raw areas. The diagnosis is confirmed by bacterial culture. In neonates, bullous impetigo can generalise and lead to sepsis.

### Staphylococcal scalded skin syndrome

Staphylococcal scalded skin syndrome is not a common condition, and is seen almost exclusively in young children. It results from infection with a toxin-producing strain of *S. aureus.* The infection may not be in the nappy area, but the rash may start there with a tender, nonspecific erythema with superficial blistering. At this stage, a very high index

of suspicion is needed. If left untreated, the rash will generalise to involve the other flexures and the perioral and periocular areas, with blistering and a generalised erythema. The child will become irritable and unwell because the rash is painful and tender.

### Streptococcal dermatitis

Group A beta-haemolytic streptococci infections may cause rashes in the nappy area, particularly in the perianal region. This problem is not confined to babies in nappies and should be considered in any child with a persistent perianal eruption. It is more common in males.

The tender, itchy rash usually has the appearance of a scaly or weeping erythema surrounding the anus, but it may extend several centimetres and may be complicated by painful fissuring that leads to constipation. Bleeding and discharge may occur. The rest of the nappy area is normal, but the same organism may cause balanitis or vulvitis either concurrently or on another occasion.

Streptococcal dermatitis is not uncommon and is easily missed unless a bacterial culture is performed. A 10-day course of antibiotic (either phenoxymethylpenicillin or roxithromycin in children allergic to penicillin) is essential for effective treatment. If penicillin dosing is difficult to comply with, amoxycillin is as effective and easier to administer.

### Bacterial superinfection in nappy rash

When a previously responsive nappy rash becomes difficult to treat, the cause may be a bacterial infection. Both staphylococcal (Figure 7) and streptococcal species may be isolated. The appearance of the rash may be indistinguishable from candidal nappy rash, but a swab for microscopy and bacterial cuture will easily differentiate bacterial superinfection from a simple candidal rash. Children who suffer from atopic eczema are prone to staphylococcal infections.

Figure 7. Staphylococcal superinfection.

Figure 8. Herpes simplex virus infection.

### Herpes simplex nappy rash

Herpes simplex is a rare cause of rashes in the nappy area. The infection is usually caused by herpes simplex virus type 1, and is usually acquired from the caregiver. A type 2 infection may be acquired congenitally from an infected mother or as a result of child abuse. Children with atopic eczema are more prone than others to herpetic skin infections.

During an initial attack, small grouped vesicles appear on an erythematous base. The initially clear vesicles rapidly become purulent and often erode to cause shallow ulcers (Figure 8). Oedema is often present, and the baby is irritable and unwell because these lesions are painful. Regional lymphadenopathy is present. The diagnosis is confirmed with viral culture and/or rapid immunofluorescence or polymerase chain reaction. There is usually spontaneous clearing in two weeks.

In children with atopic eczema, usually of a severe degree, generalisation and persistence of herpes infection may occur. If infection occurs in the neonatal period, systemic dissemination is a serious concern. These conditions require intravenous treatment with aciclovir.

When herpes infection occurs in the neonatal period, intravenous high-dose aciclovir must be started to prevent the possibility of herpetic encephalitis. A high index of suspicion is essential and treatment should be started immediately.

### Varicella

Sometimes varicella infection may present in the nappy area, generalising later. It is less common, although possible, for lesions to be confined to the nappy area. The typical appearance – clear vesicles evolving to umbilicated pustules and then crusts – is present, but diagnostic confusion with herpes simplex and staphylococcal infections may occur.

## Other viruses

Hand, foot and mouth disease (due to Coxsackie virus) can produce lesions in the nappy area. Cytomegalovirus and HIV infections can both present with blistering or eroded lesions in the nappy area.

### Tinea

True dermatophyte infections of the nappy area are very unusual and always puzzling. The typical signs of tinea are rarely seen, and the rash may present as a difficult-to-treat scaly eczematous eruption that waxes and wanes, continually changing appearance. The clue that it is a tinea infection is that there is a relatively sharp edge to the rash (Figure 9), unlike eczema (which blends into the surrounding skin). A fungal scraping will confirm the diagnosis.

## Rare conditions that may present as a nappy rash

### Congenital naevi of the nappy area

Almost any congenital naevus can occur in the nappy area, including haemangiomas,

Figure 9. Tinea.

Figure 10. Vulval haemangioma.

Figure 11. Epidermal naevus.

epidermal naevi and pigmented naevi. Haemangiomas are the most frequent of these lesions in babies, usually appearing after birth within the first month of life. In the nappy area (Figure 10), unless they form a typical nodule, haemangiomas may be mistaken for nappy rash. Painful ulceration is quite common in this site, and may be extensive enough to obliterate most of the original lesion. Extensive genital haemangiomas have been associated with anatomical abnormalities of the bladder, genital tract and lumbosacral spine. This has been termed PELVIS syndrome.

An extensive epidermal naevus may also be confused with nappy rash, and this is not made any easier by the fact that these lesions can be itchy. Epidermal naevi are rare, and may not be present at birth. They may have the appearance of a scaly, skin-coloured or slightly pigmented plaque (Figure 11), but are usually more raised than a simple rash. If they are causing a great deal of trouble under a nappy, such as around the anus, they may have to be excised.

### Traumatic lesions

Most cases of traumatic ulcers in the nappy area are due to nonaccidental injury and child abuse should be considered. Such ulcers are usually noninflammatory and well demarcated. Biopsy shows a result consistent with that seen with a burn in most cases. Infective causes should be ruled out and the child referred to a child protection unit.

### Infantile granular parakeratosis

Granular parakeratosis is a rare condition usually described in adults. It is an acquired, idiopathic disorder of keratinisation that results in linear, hyperkeratotic yellow to brown plaques in the inguinal folds as well as geometric plaques underlying pressure points from the nappy or pad. A thick, flaky scale over the plaques is characteristic.

Infantile granular parakeratosis in babies has been reported to be the result of the application of irritating nappy rash creams, particularly those containing zinc oxide. The condition is harmless and resolves once the offending substances are ceased and the child is out of nappies.

### Erosive papulonodular dermatosis

Erosive papulonodular dermatosis is also known by several other names, including infantile gluteal granuloma, perianal pseudoverrucous papules and 'Jacquet's erosive dermatitis'. It is an unusual presentation of nappy rash in which red-brown or purple oval, ulcerated nodules appear on a background of typical nappy rash.

The nodules are seen most often on the buttocks. Although it has been attributed to the use of potent topical corticosteroids on the nappy area, erosive papulonodular dermatosis has been reported in the absence of topical corticosteroids and is also seen in older children and incontinent adults. This may indicate that it is a hyperplastic reaction seen in macerated skin exposed to the irritants in faeces and urine, as well as applied topical substances.

Erosive papulonodular dermatosis is well documented in infants and older children with urinary incontinence due to neurological and anatomical abnormalities, as well as in those with chronic diarrhoea due to Hirschsprung's disease.

Although the lesions from erosive papulonodular dermatosis have an alarming appearance, the prognosis is excellent and they regress with appropriate nappy rash treatment.

### Zinc deficiency

Zinc deficiency is a rare condition that can occur in babies. This may occur because they have an inability to absorb zinc from food or because they are fully breastfed and their mothers' milk is low in zinc.

The highly characteristic rash is a brightly erythematous, eroded rash with a well-defined edge. Similar perioral eruption is also seen, and the rash is resistant to all treatment. It improves rapidly with zinc supplementation.

Rarely, biotin deficiency and cystic fibrosis have been reported to present in a similar way.

### Langerhans cell histiocytosis

Langerhans cell histiocytosis is a rare condition that presents in babies and has a predilection for the nappy area, flexures,

ears and scalp. It is usual for it to present as a recalcitrant nappy rash or seborrhoeic dermatitis. Careful examination reveals that there are elements of purpura, pustules and erosions in the rash. Diagnosis is by skin biopsy.

Although Langerhans cell histiocytosis is not considered to be a true malignancy, it may involve bone and other organ systems. The condition is treated with chemotherapy.

### Kawasaki's disease

Kawasaki's disease is a potentially serious condition of infants and young children and is relatively rare; however, it is a condition to be very aware of because of the implications of leaving it undiagnosed. A prodrome of high fevers for five days or more is followed by cervical lymphadenopathy, conjunctivitis, redness of the lips and mouth, oedema of the hands and feet, and a rash. The rash is variable but can be confined to the nappy area only. The child is systemically very unwell, and coronary occlusion is the most serious complication. In the recovery phase, peeling of the hands, feet and perianal area is common.

### Congenital syphilis

Congenital syphilis is rare in our community. The affected infants may have no external sign of the disease at birth. However, it may present in the neonatal period with a rash consisting of round or oval, copper-coloured scaly lesions most often in the nappy area and also on the face, palms of the hands and soles of the feet. Condylomata lata (moist perianal wart-like lesions) may occur and similar lesions may be found around the nose and mouth.

The infant may become unwell, with fever, hepatosplenomegaly, lymphadenopathy and rhinitis. A high index of suspicion is the key to making this diagnosis, which is confirmed by serology and dark field examination of nasal discharge and moist lesions.

### Immune deficiencies, ecthyma gangrenosum and pyoderma gangrenosum

Some serious primary immune deficiencies may present with eczematous rashes that seem difficult to treat, and this can include nappy rash. The child is often unwell with recurrent infections, and diagnosis is usually made because of systemic problems.

Ecthyma gangrenosum is an ulcerative skin condition associated with *Pseudomonas aeruginosa* and it usually occurs in immunocompromised patients. It presents with purpuric macules that progress to haemorrhagic bullae, which rapidly necrose leaving ulcers. It can be fatal in infants and is a medical emergency. Very occasionally ecthyma gangrenosum can occur in apparently healthy infants, most often after antibiotic treatment. However, any child with this condition should be investigated for septicaemia and subtle immunological abnormalities.

Pyoderma gangrenosum has been reported in the nappy area and is usually associated with immunocompromise, haematological disease and inflammatory bowel diseases.

## Managing nappy rash

### What to do about nappies

A recent Cochrane review examined the subject of the use of disposable nappies for preventing napkin dermatitis in infants.[2] It found that there is not enough evidence from good-quality randomised controlled trials to either support or refute the use of disposable nappies to prevent nappy rash. This finding, however, probably relates more to the quality of the research trials than to the use of disposable nappies in reality.

As the cause of most cases of nappy rash is a combination of overhydration, friction and heat, the aim of treatment is to reverse or minimise these factors. Common sense would dictate that the simplest way to do this is to use good-quality disposable nappies that contain absorbent polymers that trap water molecules under the surface so that the layer next to the skin is dry. It has been shown that this type of nappy maintains the skin's normally slightly acidic pH, thus protecting it from activation of faecal enzymes. Another advantage is that disposable nappies are less likely to result in overheating, particularly if they have a 'breathable' cover. This is because they are thinner than cloth nappies and can be used without the plastic and/or nylon overpants that are so often used to stop leakage and to hold cloth nappies in place.

Figure 12. Healing erosions.

Many parents express a concern about environmental issues with regard to disposable nappies. Others find that the good-quality ones that are required are prohibitively expensive. In these cases, parents may be encouraged to use disposable nappies just in situations where it will be difficult to change the baby very frequently, such as overnight or when outside the home.

If cloth nappies are to be worn, they need to be changed as soon as they become wet. Plastic pants and occlusive nappy liners should not be used. The nappies should be machine washed in hot water, well rinsed to remove laundry products, dried in a tumble dryer to make them softer.

Nappies of any sort should be changed as soon as the child defaecates, because of the irritancy of faeces. This may involve

having to wake the baby at night. It is often the best sleepers who have the worst nappy rash. Nappies should be changed at least every three to four hours.

Leaving a baby out of nappies altogether is helpful but rarely practical, particularly in winter.

## Protecting the skin in the nappy area

As most cases of nappy rash are dermatitic, the general principles of treating dermatitis apply. It is important to find out what products the parents have been using on the baby and eliminate anything that may have aggravated the situation. Soaps, bubble baths, perfumed products, antiseptics, wet wipes and powder should be avoided. Shampooing hair while the child sits in the bath results in exposure to detergent as the child sits in the shampoo-filled water.

Although the concept of using a 'barrier cream' is popular, there is no cream capable of creating a highly effective barrier between the skin and the nappy. Products such as zinc and castor oil cream have gained popularity because of this concept, but their value is as emollients.

Emolliation is important in treating all types of dermatitis, because it prevents the skin cracking and fissuring, which allows infection to supervene. Emollients should be applied at every nappy change in babies prone to nappy rash. Any greasy product is satisfactory, including zinc and castor oil cream, wool alcohol ointment, petroleum jelly, emulsifying ointment and products containing sorbolene, which may sting the skin. If the baby screams in pain when the cream is applied, the cream should be discontinued. Where erosion or ulceration has occurred, an emollient paste is helpful to protect these areas and promote healing (Figure 12).

A dispersible bath oil is helpful when bathing the baby. When changing the nappy, a damp washer with some emollient or soap-free cleanser is preferable to commercial wipes, which contain potential irritants and will probably cause discomfort. Baby wipe technology has developed more suitable products for infant skin in the past few years; however, the safest course of action is simply to keep a bottle of water and some small towels in a ziplock bag to use instead.

Harsh soaps, particularly those containing antiseptics, should be avoided. Soap-free cleansers are the best option.

## Use of topical corticosteroids

A mild topical corticosteroid is the treatment of choice for nappy rash in general.

Hydrocortisone 1% ointment should be applied three times daily until the eruption has cleared. The preparation is then used as required for recurrences and exacerbations. Topical anticandidal agents are usually used concurrently with corticosteroids. More potent topical corticosteroids are rarely required, and carry the risk of inducing atrophy, striae or gluteal granuloma.

Never underestimate the reluctance many parents feel about using topical corticosteroids on their children. Most have heard stories of the dangers of these products, and doubt their safety even when prescribed by a doctor. Strong reassurance about the safety of hydrocortisone 1% is worth giving when prescribing the product. Beware of suggesting that parents use the preparation carefully or sparingly. It is unnecessary to be sparing and such a suggestion sends a message that it is hazardous, which may result in noncompliance.

There are case reports of iatrogenic Cushing's syndrome from the use of topical corticosteroids to treat nappy rash. It is important to realise that this resulted from inappropriate overuse or use of inappropriate strength topical corticosteroids under the nappy. Preparations stronger than hydrocortisone 1% should not be used, but the 1% cream is very safe if used appropriately. A child with nappy rash that does not clear despite ongoing use of topical corticosteroids should be referred to a dermatologist.

## Complications of topical therapy

All topical preparations, even corticosteroids, have the potential to cause allergic reactions. These reactions usually present with a gradual worsening of the rash to a weeping dermatitis of such severity that oral prednisone may be required to treat it.

A much more common situation is irritancy rather than true allergy. The child may scream whenever the medication is applied because of stinging, and the rash may look more erythematous.

Allergy to topical corticosteroids can be very subtle and present only with a failure of the rash to respond to treatment.

## When to refer a baby or child with nappy rash

- When a stronger product than hydrocortisone is required – this is rarely necessary, but the situation may arise if the child is allergic to hydrocortisone or when psoriasis is present.
- When, despite all treatment strategies, there is no response – the child may have a rare condition such as zinc deficiency or Langerhans cell histiocytosis.
- When the parents are reluctant to use topical corticosteroids – they may require extra reassurance from a specialist that using such products is safe.
- When the child seems unwell and febrile, and the rash is of sudden onset – a serious condition such as staphylococcal scalded skin or Kawasaki's disease may be present.
- If a herpetic infection is suspected – aciclovir may be required.
- If there is a lump or a lesion, or an underlying haemangioma is suspected – ulcer dressings or surgical treatment may be necessary.

## Treatment of infection

Due to the frequency with which nappy rash is colonised with *C. albicans*, it is convenient to concurrently use a topical antifungal, such as nystatin or an imidazole like miconazole, with a topical corticosteroid. Although clioquinol plus hydrocortisone was previously widely used and highly effective, there has recently been concern regarding its potential for neurological toxicity and it is no longer recommended for the treatment of patients with nappy rash. Long-term use of imidazoles may become irritating and nystatin is a safer choice.

If the addition of an antifungal cream makes no difference, a swab should be taken for bacterial culture. If there is oedema, ulceration or vesicles, viral culture should be performed. If tinea is suspected, a fungal scraping should be taken.

If infection with *S. aureus* is encountered, treatment with topical mupirocin is as effective as oral antibiotics and often better accepted by parents. However, for bullous impetigo that is widespread or in a neonate, oral flucloxacillin is the drug of choice. Staphylococcal scalded skin syndrome should be similarly treated. *S. pyogenes* infections should be treated with oral phenoxymethylpenicillin, amoxycillin or erythromycin for 10 days, and the concurrent use of mupirocin ointment will help to prevent a recurrence.

## Advice for parents and carers

Noncompliance is a major factor in the failure of nappy rash management. Nappy rash is such a common problem that almost everyone will have advice for your patient. As a result, many different treatments may have been tried, but few persevered with.

As in all dermatitic conditions, there is a tendency to relapse when treatment is ceased and, unless this is clearly explained, patients interpret relapse as treatment failure. Parents need to understand both the benign self-limiting nature of this condition and also its chronicity in many cases. Keeping it simple is a vital part of making treatment a success, and emphasis on the need for ongoing treatment is also essential.

A useful handout for patients is available on page 53.

## What to do if treatment fails

### Check compliance

Have the parents and other carers been following advice, or is there a reluctance to use the prescribed medications? Has extra advice from well meaning friends and relatives complicated the issue? Did the parents persevere with treatment for more than a few days? These questions should be asked to check compliance with the treatment prescribed.

### Rule out allergy and irritancy

True allergic contact dermatitis is not usually subtle and presents with an acute weeping deterioration of the rash. However, contact irritation is more subtle and may occur with almost any topical preparation, including antifungal and corticosteroid creams, emollients, wet wipes and topical antibiotics.

If one of the preparations being used is suspected of causing a problem, stopping all topical therapy and using only one or two different preparations may remove the irritant. Also, hydrocortisone cream should be changed to an ointment that is preservative free.

### Rule out and treat infection

Taking a swab for bacterial microscopy and culture from the skin surface can rule out infection. This sort of swab will detect *C. albicans* as well as bacteria. If vesicles are present, viral culture should be performed as well. In a patient with a recalcitrant, scaly rash, a fungal scraping should be taken to rule out tinea.

### Refer to dermatologist

The box on page 51 lists instances when the patient should be referred to a dermatologist.

## Prognosis

The prognosis for patients with nappy rash is usually excellent. In most cases, there is a rapid response to simple treatment. However, the course of the condition may remit and exacerbate, and some children are never completely free of it until they are out of all nappies, including night nappies. In this situation, it is important to reassure the parents of the self-limiting nature of the condition and encourage them to aim for the comfort of the child rather than a perfect-looking nappy area.

In cases where the underlying condition is psoriasis or atopic eczema, the prognosis is more guarded. These patients may sometimes go on to have persistent problems in the genital area. It is not possible in early childhood to predict whether this will happen, and follow up is recommended.

## Conclusion

Nappy rash is one of the most common dermatological conditions in childhood. Most cases can be managed successfully in general practice with simple advice regarding use of nappies, good skin care practices and treatment with mild corticosteroid and antifungal creams. Even unusual presentations that may seem alarming, such as ulceration or gluteal granuloma, respond to simple measures.

Occasionally a case is seen where there is continuing deterioration despite treatment. In this situation, superinfection or allergy to a topical medication may have occurred, but more often the parent is simply confused about advice and unable or unwilling to comply. If there has been no response to a reiteration of initial advice and a change of medication, or if an unusual or serious diagnosis is suspected, referral to a dermatologist is justified. MT

## References

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2. Baer EL, Davies MW, Easterbrook K. Disposable nappies for preventing napkin dermatitis in infants. Cochrane Database Syst Rev 2006; (3): CD004262.

## Further reading

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