

# Secondary infection and eczema

Dermatology Nurse Specialist, **Helen Dennis**, describes the signs, causes and treatment.

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It is hard to imagine, but the number of bacterial cells found on the skin is greater than the Earth's entire population, and that is currently estimated to be 7.5 billion – to save you looking it up, a billion is 1,000,000,000! The skin is the most important protection we have against infection, as it provides a barrier that keeps bacteria out of the body. However, when you have eczema the top layer of the skin is often damaged.

This damage can be clearly visible to the naked eye, appearing as fissures and areas opened up by scratching. There is also less protection within the skin – i.e. changes to the cell layer called the stratum corneum in the epidermis, which you cannot see. Skin cells grow out from a basement membrane to the skin's surface and are then shed. It is thought that in at least half of people with eczema this layer is slightly different, giving rise to an impaired barrier function within the skin. These alterations in the barrier function of the skin increase the potential for skin infection. These infections are often described as secondary infections, which means that they develop because of the underlying condition of eczema.



*Staphylococcus aureus* infection

## Bacterial infection

***Staphylococcus aureus*** is the bacterium that is most commonly responsible for secondary infection of eczema. It is often associated with hair follicle infections (folliculitis), boils and abscesses. 'Impetiginised eczema' is another label or name given to eczema infected with staphylococci. When the bacteria penetrate the epidermis, an immune reaction can be triggered that aggravates the eczema and brings about a flare. It is thought that the bacteria drive the eczema on.

Initially, eczema infected by *S. aureus* will appear itchy and red. If you look closely in natural light, you will see a tangerine glisten to the skin – a little bit like orange body shimmer dust. As the infection progresses, weeping and crusting with a yellow/golden tinge will be evident.

Bacterial skin infections are treated with antibiotics, either topically using a cream or orally with tablets or liquid suspensions. Whether the doctor gives you a cream or tablets depends on the size of the infection and the number of sites of infection. When treating the infection with a cream, it is important that

you apply it consistently (as if you were taking a course of oral antibiotics). Topical antibiotics should not be used for longer than 14 days or bacterial resistance can develop.<sup>1</sup>

Skin infections can sometimes be caused by a resistant strain of *S. aureus* such as **Methicillin-Resistant *Staphylococcus aureus* (MRSA)** – often referred to by the media as a ‘superbug’. If you are not responding to antibiotics, then a skin swab should be taken to confirm the strain of bacteria and also which antibiotics it is sensitive to. MRSA bacteria are usually spread through skin-to-skin contact with someone who has an MRSA infection or who has the bacteria living on their skin. MRSA can also be spread through contact with everyday objects such as towels, sheets, taps, surfaces and door handles. You can take the following steps to reduce your risk of picking this up:

- Wash your hands carefully before applying your emollients and treatments.
- When visiting a clinic or hospital, use the hand gels at doorways in the hospital and report any unclean toilet or bathroom facilities to the staff.

Fortunately, MRSA bacteria are not resistant to all antibiotics so the infection is still treatable. Skin infections due to MRSA are usually treated with antibiotics in tablet form, or sometimes intravenously if the infection is widespread.

## Viral infections

The *Herpes simplex* virus usually just causes cold sores, but in people with eczema it can spread through the skin and develop quickly into a serious condition called **eczema herpeticum**.



Eczema herpeticum

The symptoms of this viral infection include:

- areas of painful eczema that quickly get worse;
- groups of fluid-filled blisters that break open and leave small, shallow, open sores on the skin; and
- in some cases a high temperature and generally feeling unwell.

**Obtaining treatment quickly is important with this infection – it cannot be left until the morning! You should see a doctor immediately if you think you have eczema herpeticum. If you cannot be seen by your GP, call NHS 111 or attend the nearest A&E department.**

The virus is spread through direct contact – both skin-to-skin and contact with surfaces (the virus can live for a few hours on hard surfaces). To prevent infection spreading, let the surgery or hospital staff know on arrival what you think you have so that you can wait in a private area until the doctor assesses you.

If you have eczema herpeticum, you will be treated with an antiviral called acyclovir and often patients are admitted to hospital for a few days in order to receive the therapy intravenously.

## Fungal infections

As with bacteria, certain fungi live naturally on everyone’s skin. There are two main fungal infections that infect people with eczema. One is caused by **candida**, a yeast that thrives in warm, moist areas of the body such as the armpits and groin, and the neck area in children. The other type originates from moulds called dermatophytes that cause an infection known as **tinea or ringworm** – this describes the shape of the skin lesions and has nothing to do with actual worms!

Candida infections can be treated with a cream containing clotrimazole that can be purchased from a pharmacy. Tinea infections on the body respond well to miconazole creams and these too can be purchased from a pharmacy. Tinea commonly affects the nails – if you have tinea on the nails or scalp, oral tablets are needed and your doctor will prescribe them.

## Preventing infection

Simple measures such as **always washing your hands** before applying topical treatments can make a big difference. Remember to **decant emollients** from any tubs you may be using – if you dip your fingers into a tub, it can easily become contaminated with bacteria. A metal dessert spoon is easy to find for decanting and washes well under the tap. If you are using **pump dispensers** for your emollients, you do not need to decant – you can just pump the cream onto your hand, but avoid touching the nozzle.

Some people with eczema suffer recurrent bacterial infections and require antibiotic treatment on several occasions. For this group, strategies to prevent infection are often

recommended. The use of **antiseptic washes or creams** is often advised to reduce the amount of *S. aureus* on the skin. Often these antiseptics are triclosan, chlorhexidine gluconate or sodium hypochlorite. They come combined with emollient preparations and can be used to wash with in the bath or as a leave-on treatment. One of the advantages of controlling infections with antiseptics is that they do not create or develop bacterial resistance.

**Bleach bathing** is an emerging strategy for treating people with recurrent infections. There are a few small trials that report positive outcomes<sup>2,3</sup> but as yet there are insufficient large-scale studies that provide an evidence base for the use of bleach bathing, so it must be used with caution and under the supervision of your doctor. The term ‘bleach bathing’ can sound rather alarming and it is important to be careful as harm can be done if the wrong substance is used or in too high a concentration. Bleach bathing uses the chemical sodium hypochlorite, which is effective against bacteria, fungi, viruses and MRSA.

The principle of bleach bathing is that you would bathe in the bleach solution twice a week, and in between continue with your usual treatment routine. You cannot use household bleach for this bathing as the concentration of sodium hypochlorite will vary in products and most will have additional chemicals that could cause harm. Milton Sterilising Fluid at a strength of 2% sodium hypochlorite is the only product that currently provides the strength used in the research trials. It does not contain any perfumes or colourants and does not degrade, so it provides a stable strength.

Milton Sterilising Fluid (2%) has been adopted by hospitals and can be bought cheaply from

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pharmacies. When adding it to bath water you are aiming for a strength of 0.004% and nothing else should be added to the bath, so you would not add any bath emollients you have been prescribed when bleach bathing. To make sure you have the right dilution you first need to work out how many litres of water there are going to be in the bath. You can do this just once using a measuring jug and then make a mark on the bath (e.g. with gaffer tape) at the water line to show you what level you need to fill the bath to each time when bleach bathing. You then need to add 2 ml of Milton to every litre (1000 ml) of bath water.

### Conclusion

Skin infections are common in people with eczema and it is highly likely that at some time you will experience either a bacterial, fungal or viral infection. All of these infections require intervention to clear them up as they do not improve on their own. The quicker the infection is recognised and the sooner treatment is started, the better the response is to treatment. Preventing infections is also important, from simple hand-washing before applying your creams to more sophisticated methods using antiseptics.

### References

1. National Institute for Health and Clinical Excellence (2007) Atopic eczema in children: management of atopic eczema in children from birth up to age of 12 years: CG 57 available online at [www.nice.org.uk/GC57](http://www.nice.org.uk/GC57) Section 7.6
2. Barnes TM & Greive KA (2013) Use of bleach baths for the treatment of infected atopic eczema. *Australas J Dermatol.* 54(4):251–8
3. Gonzalez ME, Schaffer JV, Orlow SJ, Gao Z, Li H, Alekseyenko AV & Blaser MJ (2016) Cutaneous microbiome effects of fluticasone propionate cream and adjunctive bleach baths in childhood atopic dermatitis. *J Am Acad Dermatol.* 75(3):481–93 e8. doi: 10.1016/j.jaad.201