



## The basics of bacterial skin infections

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The skin is the human body's largest organ and the first line of defence against invading micro-organisms. Environmental factors such as sunlight, chemicals and pollution, as well as trauma through accidents, surgery or burns, compromise this skin barrier allowing micro-organisms to enter and possibly cause infection.

Bacterial skin infections are often first seen in the pharmacy setting. Recognising that infections can present differently depending on the age of the patient, the part of the body affected, as well as the type of bacteria causing the infection, will help in making the best recommendations for treatment.

This article focuses on the most common bacterial infections of the skin that may present in the pharmacy setting.

Bacterial skin infections may affect the skin and soft tissue (e.g. impetigo, boils, carbuncles and folliculitis) or the skin structure (e.g. cellulitis).

### Impetigo

Impetigo is a highly contagious bacterial infection that develops on the surface layer of the skin, either as a result of certain bacteria directly invading the skin or as a result of damage to the skin initially caused by another type of condition (e.g. eczema) or trauma (e.g. scratching).

*Staphylococcus aureus* is the most common cause of impetigo, but the infection may also be caused by other organisms.

### Who is at risk?

Both adults and children can develop impetigo. However, it is more commonly seen in children. The bacteria that cause impetigo usually flourish in a warm, moist environment and

many people are asymptomatic carriers and 'carry' these bacteria, without having symptoms, in the nose and throat (nasopharyngeal area).

### What does it look like?

Impetigo typically begins with red, pimple-like sores, which develop into clusters of fluid-filled blisters (vesicles) or pus-filled blisters (pustules). Characteristic to impetigo is the honey-coloured crust or scab that develops when these vesicles or pustules break open. It is common for the sores to itch, and scratching of these sores spreads the infection to the surrounding skin. Children will usually present with impetigo around the nose and mouth area, but it can occur anywhere on the body (including the diaper area in babies).

### How is impetigo treated and its spread prevented?

The spread of impetigo may be prevented by the following:

- Encouraging patients, especially children, not to touch or scratch the lesions.
- Gently cleaning the infected area with soap and water to remove any crusts.
- Regularly washing hands with soap and water, especially after touching the affected area.
- Avoiding touching objects that a person with impetigo has used, e.g. towels, clothing, sheets.
- Keeping fingernails short, especially in children.

Impetigo is usually treated with a topical antibiotic, such as mupirocin. Oral antibiotics may need to be prescribed if the lesions are not responding to topical antibiotics.

### Furuncles and carbuncles

Furuncles (also known as boils) occur when a hair follicle becomes infected, with the infection involving the entire pilosebaceous unit (i.e. the hair follicle, the hair shaft and the sebaceous gland). Carbuncles are a cluster of furuncles that are joined together below the surface of the skin.

### Where do they occur?

Pus-filled furuncles most commonly occur on the upper neck, breasts, face, chest and buttocks. They are usually sensitive to the touch and may be painful depending on where they occur. Although furuncles can be painful, the patient does not usually show other systemic symptoms.

Carbuncles can occur in the same areas as furuncles, but can also be found on thighs, groin, or armpits. These may rupture, releasing a creamy or pinkish fluid. Bacteria from the carbuncle may infect the surrounding tissue and lymph nodes, causing these patients to feel sick and have a fever.

### How are they prevented?

Patients who have recurring furuncles are advised to wash their skin regularly with an antiseptic soap. Topical nasal antibiotic ointments may also be prescribed to eliminate the bacteria in the nasal passages. Some patients may also be prescribed a long course of antibiotics to prevent recurrence of furuncles.

### How are they treated?

Furuncles may be treated by application of warm compresses, which helps the furuncle to drain. However, in many cases, the patient may need to be referred to a doctor to have the furuncle lanced (cut) and drained. Patients with carbuncles will need to be referred to a doctor for treatment.

## Folliculitis

Where furuncles affect the entire pilosebaceous unit (see above), folliculitis affects only the hair follicles. The bacterium mostly involved in this infection is *Staphylococcus aureus*, but *Pseudomonas aeruginosa* is commonly associated with specific exposures (i.e. hot tubs and spas).

### What does it look like?

Tiny red bumps filled with pus occur at the base of a hair. Either a single hair follicle or many may be infected. The affected hair follicles itch, and are sometimes painful, but the patient is otherwise well.

### Who is at risk?

Folliculitis is linked to shaving, tight hair braids, ingrown hairs and skin conditions such as acne.

- Sportsmen or women can develop mild folliculitis under sports equipment or on the buttocks, where moisture accumulates or friction occurs.
- People using hot tubs or spas that have not been chlorinated properly are at risk of developing folliculitis from *Pseudomonas aeruginosa*. The infection usually presents about six hours and up to five days after exposure to the water and usually involves the areas mostly covered by a swimming costume, such as the torso and buttocks. Children are more susceptible to “hot-tub folliculitis” as they tend to spend a longer time in the water and have more sensitive skin.

### How is it treated?

- Warm compresses may be placed on the affected area.
- Antibacterial cleansers and topical antibiotics, such as mupirocin, may be applied to the affected area.
- Patients should be advised to temporarily stop shaving areas that are affected by folliculitis.
- Patients with large areas of folliculitis, or who have severe infection, may need to be referred to a doctor for oral antibiotics.
- Folliculitis due to hot tubs or spas usually goes away on its own without any treatment within a week.

## Cellulitis

Cellulitis is a bacterial infection involving the soft tissue of the skin. It can be caused by many different bacteria, but is usually caused by *Staphylococcus aureus* or *Streptococcus*, which are normally present on the skin or in the nasopharyngeal area.

### Who is usually affected?

Anyone who has had skin broken for whatever reason, such as after recent surgery, or a burn, is at risk of having the bacteria enter the skin and causing an infection. Cellulitis can sometimes also occur in skin where there is no evidence of any trauma.

### What does it look like?

The affected area is usually swollen, red, and warm to the touch. The skin does not typically have blisters or pimples (although this may occur in some cases), but is rather smooth and shiny. The hot, swollen skin accumulates fluid under it (oedema) giving it a pitted, or “orange peel” appearance. Pain and tenderness occur over the affected area. Patients with cellulitis often have fever and are generally unwell.

### Where does it usually occur?

Cellulitis most commonly affects the leg, but can also involve the arm, breast, area around the eye, and the abdominal wall.

### How is it treated?

While many cases of cellulitis are mild, the infection usually requires treatment with antibiotics and will therefore need to be referred to a doctor. Patients who are diabetic, have signs of a systemic infection, or have rapidly deteriorating skin changes, should be encouraged to seek medical attention as soon as possible.

## Conclusion

Patients with bacterial infections of the skin can present in many different ways. These may vary from a mild infection, with no systemic involvement, to the more serious conditions where the patients show signs of the skin infection affecting them systemically. It is important to recognise these signs and to refer them for prompt medical attention where necessary. All patients should be encouraged to adopt strict hygiene measures in order to prevent the spread of infection.

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