

# Managing skin infections in Māori and Pacific families

The background of the page is an abstract graphic composed of various geometric shapes, primarily triangles and circles, in shades of teal, green, and yellow. The shapes are arranged in a way that creates a sense of depth and movement, with some elements appearing to overlap or be part of a larger, interconnected structure. The overall aesthetic is modern and clean.

*The number of people in New Zealand requiring hospitalisation due to bacterial skin infections is rising. Although the majority of patients have skin infections that are mild to moderate in severity and respond to treatment with oral antibiotics in a community setting, some patients develop more serious skin infections that require treatment in hospital. Māori and Pacific families and families from lower socioeconomic communities are more at risk. Healthcare professionals can help prevent these disparities from widening by targeting education, prevention and control interventions.*

## Serious skin infections are increasing

Compared to other developed countries, New Zealand has high rates of serious skin infections, particularly among children, e.g. the rate of cellulitis in children in New Zealand is twice that of children in Australia and the United States.<sup>1</sup> In addition, there is evidence that the situation is worsening. New Zealand public hospital data shows that the number of children admitted for treatment of serious skin infections, e.g. cellulitis and abscess, has almost doubled from 298 per 100 000 children in 1990, to 547 per 100 000 in 2007.<sup>1</sup>

### Ethnicity, age and socioeconomic factors influence rates of serious skin infections

An analysis of the epidemiology of serious skin infections that resulted in hospital admission in New Zealand children from 1990 to 2007 reported that rates were higher among:<sup>1</sup>

- Māori and Pacific children
- Children from lower socioeconomic families
- Preschool children
- Boys
- Children from urban areas and from the upper half of the North Island

From 1990 to 1999 **Māori and Pacific children** were 2.3 and 3.7 times, respectively, more likely to be admitted to hospital for a skin infection than children of other ethnicities.<sup>1</sup> Between 2000 and 2007 this increased to 2.9 and 4.5 times, respectively.<sup>1</sup>

The incidence of serious skin infections is heavily influenced by **socioeconomic factors**. During the period 1990 – 1999 the rate of infection in children from areas classified as NZDep 9 – 10 (most deprived) was 3.6 times greater than for areas classified as NZDep 1 – 2.<sup>1</sup> Between 2000 and 2007 this ratio increased to 4.3.<sup>1</sup>

The highest rates of hospitalisation for serious skin infections occurred in **children aged less than five years**, who had more than twice the risk of serious skin infection than children aged five to nine years.<sup>1,2</sup> The lowest rates were for children aged 10 – 14 years.

The incidence of serious skin infection requiring hospitalisation was significantly higher in **boys** than in girls.<sup>1</sup>




Rates of serious skin infections were 1.8 times higher for **children living in urban areas** compared to those living in rural areas.<sup>1</sup> Higher rates of serious skin infection were found among **children from the North Island** compared to children from the South Island. Rates in the Tairāwhiti (Gisborne) region from 2000 – 2007 were the highest in New Zealand, even when standardised for age, ethnicity and deprivation (see “Epidemiology of skin infections”).<sup>1</sup>

### What are the common pathogens that cause skin infections?

*Staphylococcus aureus* and *Streptococcus pyogenes* (Group A beta-haemolytic Streptococcus) are the most common bacteria that contribute to skin infections. These bacteria are commensals of the skin (inhabit the skin) and invade the skin via any breach in the skin barrier or via mucous membranes. Broken skin can be the result of an injury or be a consequence of a pre-existing skin condition, such as eczema, chickenpox or scabies.

Acute rheumatic fever is most frequently associated with pharyngitis secondary to group A streptococcus, however, there is some evidence that children with *S. pyogenes* skin infections, e.g. impetigo, may also be at risk of rheumatic fever.<sup>5</sup> Post-streptococcal glomerulonephritis can also develop as a complication of *S. pyogenes* skin infections.

## Treating infections of the skin

	Features	Medication	Other treatment
<b>Impetigo</b>  See "Management of impetigo" BPJ 19 (Feb, 2009) and "Skin infections in Pacific peoples" BPJ 32 (Nov, 2010)	<ul style="list-style-type: none"> <li>Highly infectious bacterial infection (usually <i>S. aureus</i> and/or <i>S. pyogenes</i>)</li> <li>Most frequently seen in children but can affect people of any age</li> <li>More common in warm and humid conditions, if the normal skin barrier is impaired and in conditions of poor hygiene</li> </ul>	<ul style="list-style-type: none"> <li>Topical antibacterial (e.g. fusidic acid) for seven days</li> <li>Oral flucloxacillin for seven days if extensive, slow to respond to topical treatment or recurrent</li> <li>Nasal swab and intranasal antibiotics (e.g. fusidic acid) may be required for recurrent infection</li> </ul>	<ul style="list-style-type: none"> <li>Cephalexin oral suspension (25–50 mg/kg/day, in two or three divided doses) is an alternative to flucloxacillin suspension if this is not tolerated</li> <li>Crusted areas can be removed or covered</li> <li>Avoid preschool or school for 24 hours after initiation of treatment</li> <li>Use separate towels and other linen and advise regular hand washing</li> </ul>
<b>Boils and abscesses</b>	<ul style="list-style-type: none"> <li>Commonly caused by <i>S. aureus</i></li> <li>Any breach in the normal skin barrier can lead to the development of a boil, carbuncle or abscess</li> </ul>	<ul style="list-style-type: none"> <li>Most boils and fluctuant abscesses can be treated with incision and drainage alone</li> <li>Oral flucloxacillin for seven to ten days may be considered if there is fever, surrounding cellulitis or a co-morbidity likely to cause complications e.g. diabetes</li> </ul>	<ul style="list-style-type: none"> <li>Fluctuant abscesses require incision and drainage. Children in particular may require referral for surgical drainage under sedation or general anaesthetic</li> <li>Decolonisation may be required in patients with recurrent boils (Page 19)</li> <li>Household linen and clothes should be decontaminated (Page 17)</li> <li>If indicated by nasal swab results, intranasal antibiotics (e.g. fusidic acid) can be considered for recurrent infections</li> </ul>
<b>Cellulitis</b>  See "Skin infections in Pacific peoples" BPJ 32 (Nov, 2010)	<ul style="list-style-type: none"> <li>Usually due to <i>S. aureus</i> and/or <i>S. pyogenes</i></li> <li>Higher incidence in people with conditions such as diabetes, obesity, venous disease, alcoholism and with injury or trauma</li> <li>More frequently seen in children and elderly people but can occur at any age</li> </ul>	<ul style="list-style-type: none"> <li>Oral flucloxacillin for seven to ten days</li> <li>Erythromycin, roxithromycin, cefaclor and co-trimoxazole are alternatives</li> </ul>	<ul style="list-style-type: none"> <li>Flucloxacillin or cephalexin oral suspension recommended for children</li> <li>Referral for IV antibiotics may be required in severe cases, children aged under one year or if cellulitis is periorbital or orbital, surrounds a limb, located over a joint or fails to respond to oral antibiotics</li> <li>Appropriate analgesia and elevation of the affected area is recommended</li> </ul>
<b>Infected Eczema</b>  See "Managing eczema" BPJ 23 (Sep, 2009)	<ul style="list-style-type: none"> <li><i>S. aureus</i> commonly colonises eczema lesions</li> <li>Infection is suggested by lesions that are crusted, weeping or failing to respond to treatment</li> </ul>	<ul style="list-style-type: none"> <li>Topical antibacterial (e.g. fusidic acid) for seven days may be sufficient for localised areas</li> <li>Oral flucloxacillin is required if there are extensive areas of infected eczema</li> </ul>	<ul style="list-style-type: none"> <li>Decolonisation of <i>S. aureus</i> may reduce the severity of eczema in patients with secondary infection (Page 19)</li> </ul>


### Notes:

Cephalexin oral suspension is now available fully subsidised in two strengths (125 mg/5 mL and 250 mg/5 mL). It can be used as an alternative to flucloxacillin oral suspension because it is more palatable, does not need to be taken on an empty stomach and can be given twice or three times daily.<sup>18</sup>

Recommended oral flucloxacillin dose – Adult 250–500 mg; Child 2–10 years 125–250 mg; Child 1 month–2 years 62.5–125 mg; every 6 hours, at least 30 minutes before food.<sup>19</sup>



**People with diabetes** are at increased risk of skin infections, both bacterial and fungal, and often have delayed wound healing.<sup>5</sup> Foot infections are particularly problematic in people with diabetes, and in some cases can result in amputation.

 For further information see: "Screening and management of the diabetic foot", BPJ 31 (Oct, 2010)

**People who are obese** are at increased risk of poor wound healing.<sup>6</sup> A higher incidence of cellulitis, folliculitis, paronychia and boils are associated with obesity.<sup>7</sup> Increased rates of intertrigo are also associated with an increased BMI. This is likely to be due to the characteristic features of larger skin folds where the skin is wetter and warmer and there is increased friction with adjacent skin causing inflammation and maceration. Fungal infections, e.g. *Candidia albicans* and tinea, are common causes of intertrigo.


**People who smoke** are at increased risk of delayed wound healing, which in turn can increase the risk of a skin infection.<sup>6</sup>

**Other factors** that are associated with an increase in the incidence of skin infections include: excessive alcohol intake, pregnancy, recent surgery or trauma, burns, radiotherapy and chemotherapy.

## Management of recurrent skin infections

### The importance of good hygiene

Hand washing is the most effective way to reduce the transmission of microorganisms from one person to another.<sup>8</sup> Hands should be washed frequently with soap and clean water and then dried. The active ingredient in antibacterial soap is not present in sufficiently high concentration to be any more effective than plain soap, e.g. triclosan 0.1 – 0.4%.<sup>9</sup> There are also concerns that use of soaps containing triclosan can promote cross-resistance of bacteria to some antibiotics, such as amoxicillin, tetracyclines and mupirocin.<sup>9</sup> Alcohol based rubs are the most effective method for eliminating bacteria from the hands, however, these products may be unaffordable, and therefore impractical for everyday use.<sup>10</sup>

 **Best practice tip** – When washing your hands after examining a patient, reinforce to parents/caregivers the importance of this simple effective form of infection control.

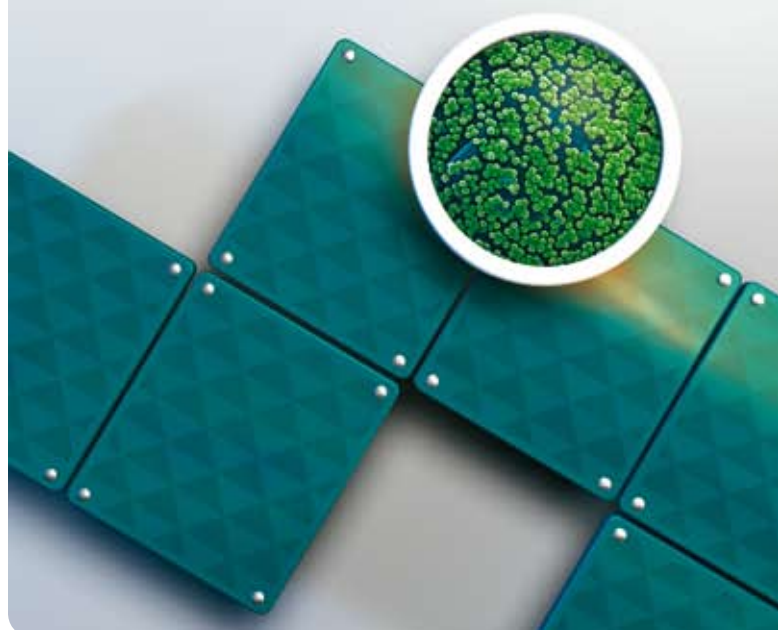
Household cleaning procedures are especially important for families living in crowded conditions. There should be a focus on high-touch surfaces that bare skin is frequently in contact

## The epidemiology of skin infections in primary care

Incidence rates for serious skin infections are largely derived from hospitalisation data, however, the majority of patients with skin infections are managed in primary care. A study has been carried out to determine if the findings relating to the epidemiology of serious skin infections resulting in hospitalisation reflect the situation in primary care.<sup>3,4</sup>

Data collected from General Practitioners in the Tairāwhiti region was compared to hospitalisation data from the same period. The population in the Tairāwhiti region has a high proportion of young Māori and also high levels of deprivation, but even after adjusting for these factors, the rates of serious skin infections in this region are the highest recorded in New Zealand. Although the study was based on a small sample size, it suggests that the epidemiology of skin infections in general practice is similar to that reflected by hospitalisation data.

For every child hospitalised for a serious skin infection, 14 children were estimated to have been successfully treated in primary care.<sup>3</sup> Although lower numbers of pre-school children with skin infections were seen in primary care, these children accounted for approximately two-thirds of those hospitalised. The authors speculate that although this could be due to the small sample size, it may suggest that General Practitioners have a lower threshold for referral in this age group or alternatively the presence of more severe infections.



with, such as bench tops, door knobs, bath tubs and toilet seats. Linen and towels should not be shared. To decrease the chance of an infection spreading to other family members, ideally hot washes should be used for towels and linen, however, this may be unaffordable for many families. An alternative is the addition of a capful of bleach to the regular wash cycle (or when hand washing clothes). Drying clothes in a dryer on a hot setting and using an iron (preferably with steam) may further reduce the bacterial load.

### Encourage good first-aid at home

Explain the importance of cleaning and covering cuts and sores, especially for children at school or preschool and playing contact sports. Clean water is sufficient for cleaning wounds. Generic brands of adhesive plasters can be purchased to cover skin lesions.

### Manage skin conditions such as eczema


Eczema is estimated to affect 15% of Māori children and 16% of Pacific children in New Zealand, compared to approximately 10% of children of other ethnicities.<sup>11, 12</sup> As it is often characterised by *S. aureus* colonisation, eczema significantly increases the risk of invasive bacterial infections.<sup>13</sup> Managing eczema is therefore an important aspect of preventing recurrent skin infections.

The main aims of management are to control the factors that exacerbate eczema, to use anti-inflammatory treatment (e.g. topical steroids) to control exacerbations when they do

occur, and to maintain the barrier function of the skin with emollients.

Routine use of antiseptics and antimicrobial creams for the prevention of infection in pre-existing lesions is not recommended due to a lack of evidence that they are effective, issues of affordability and uncertainty as to whether they promote resistant strains of bacteria.<sup>14</sup> Decolonisation measures may help reduce the severity of infected eczema (Page 19).<sup>15</sup>

It is important that families are given adequate information and explanation, so they understand when to use medicines or other treatments, how to apply them and when to seek further help. Nurse-led eczema clinics for patients and their families are offered by some practices and DHBs.

 For further information see: "Managing eczema", BPJ 23 (Sep, 2009).

### Promote healthy lifestyles

Good nutrition has an essential role in wound healing, as well as being important in maintaining healthy skin.<sup>20</sup> Nutritional deficiencies can cause wounds to heal more slowly, however, there is no clear evidence to suggest that advising people to take specific dietary supplements will improve the clinical outcome.<sup>20</sup> In addition to promoting good nutrition, advice should be given about attaining or maintaining a healthy weight. Smoking cessation remains a vital component when discussing healthy lifestyles.

## MRSA incidence increasing

Methicillin-resistant *Staphylococcus aureus* (MRSA) incidence in New Zealand has slowly increased since 2001. Eight strains of MRSA are currently recognised in New Zealand.<sup>16</sup> In 2010 there were 740 people identified with MRSA in New Zealand (17.3 per 100, 000 people), with approximately half of these cases being categorised as community-associated.<sup>16</sup> MRSA in the community typically affects younger people, particularly Māori and Pacific peoples.<sup>16, 17</sup> Counties Manukau DHB recorded the highest rate of MRSA, with over 40 cases per 100 000, while Northland and Waikato DHBs also recorded rates significantly above the national average.<sup>16</sup>

Patients with any non-healing wound or an infected surgical wound that is not responding to first-line antibiotic treatment should have a wound swab taken to check for the presence of MRSA and to guide antibiotic choice. Appropriate antibiotics for treatment of MRSA in the community include co-trimoxazole, clindamycin (requires specialist endorsement), and tetracyclines, but the choice must be guided by susceptibility information because of the emergence of multi-resistant strains.

## Encourage patients to seek medical attention early

Medical attention should be sought for any wound or lesion in or near an eye, regardless of whether it is infected. As a general guide, people with wounds or other skin lesions larger than approximately 15 mm in diameter, or people with a wound that is failing to improve or worsening should also seek medical attention.

## Decolonisation measures

Decolonisation may be considered where a patient and their family members are developing recurrent skin infections, despite optimised hygiene and wound care measures, and where conditions such as eczema and diabetes are well controlled.<sup>21</sup> There is evidence that the combination of bleach baths, intranasal antibiotics and education about personal and household hygiene is the most effective regimen for *S. aureus* decolonisation in the community.<sup>22</sup>

Decolonisation treatments include:<sup>21</sup>

- Nasal decolonisation with topical antibiotics (applied with a cotton bud or finger), e.g. fusidic acid or mupirocin 2% ointment (usually reserved for MRSA, choice guided by susceptibility testing), twice daily for five days
- Topical body decolonisation with dilute bleach baths (see below) or triclosan 1% solution applied as a whole body wash daily for one week, repeated if required (subsidised by endorsement for patients with recurrent *S. aureus* infections)

Surveillance cultures following a decolonisation regimen are not routinely recommended in the absence of an active infection.<sup>21</sup>

## Bleach baths for decolonisation

Bleach baths can be used two to three times a week (repeated if required) to prevent recurrent *Staphylococcus aureus* skin infections. A quarter to half a cup of unscented household bleach (sodium hypochlorite 6%) can be added to bath water.<sup>23</sup> The patient should stay in the bath for five to ten minutes and then rinse with fresh water. Children should be supervised to avoid ingestion of bath water. If medications or emollients are required they should be applied after the skin has been patted dry. Bleach baths should not be used if there are extensive areas of broken skin.

## Traditional tattooing

Traditional tattooing is a part of the culture of many Pacific peoples, e.g. ta tatau is the process of traditional tattooing from Samoa. Over the last ten years, complications such as severe cellulitis and septic shock have been reported among people who received tatau, including one death.<sup>24</sup> In 2010, the Ministry of Health, in conjunction with community leaders and infectious disease specialists, published guidelines aiming to increase the safety of traditional tattooing.<sup>25</sup>

One of the risk factors for infection may be that the traditional tools used for tattooing are made from materials such as shell, teeth, bone and wood and cannot be sterilised by autoclaving. The best alternative, although not as effective as autoclaving, is for the tools to be carefully cleaned, e.g. with an ultrasonic cleaner, and then soaked in a chemical sterilising solution.<sup>25</sup>

The use of unsafe practices in any form of tattooing can increase the risk of infection, including that of serious blood-borne infections such as hepatitis B and C and HIV. Cellulitis may be difficult to diagnose in the presence of acute inflammation from the localised trauma to the skin and the heavy use of pigments.<sup>26</sup> Local councils in many areas have bylaws which aim to reduce the risks associated with tattooing, however, there are currently no national regulations covering tattooists, their studios or the inks used.



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