

Skin Infections in Children

PRINCIPLES OF MANAGEMENT

Skin infections in the Kimberley contribute to significant illness and burden within the community. Skin infections occur at disproportionately high rates compared with the rest of Australia as a result of ongoing socioeconomic disadvantage including overcrowding and insufficient sanitation facilities.

Bacterial skin infections are a particular concern. They can lead to acute post streptococcal glomerulonephritis (APSGN), bone and joint infections and sepsis and are associated with acute rheumatic fever (ARF) and rheumatic heart disease (RHD). The burden of skin disease can be reduced by:

1. Strengthening health literacy to better prevent, identify and manage skin infections through family and community education. See this [handbook for community care workers on keeping skin healthy](#):
<https://infectiousdiseases.telethonkids.org.au/siteassets/media-docs---wesfarmers-centre/handbook-for-healthy-skin.pdf>
2. Improving clinical practice habits in order to treat episodes effectively, prevent serious complications and limit the development of antibiotic resistance.
3. Effective and timely scabies treatment and environmental improvements. Scabies is frequently an underlying cause of skin infection.
4. Ongoing advocacy for reduction in socioeconomic disparities.

KEY PATIENT EDUCATION MESSAGES

- ☞ Skin sores are common but not normal.
- ☞ They can have serious consequences.
- ☞ Always get sores checked at the clinic.
- ☞ Keeping skin, clothes and beds clean helps to stop sores by reducing the amount of germs in the environment and on the skin and in the environment that cause skin sores.
- ☞ Cover sores to stop spread to other people.

SCREENING

Examine skin opportunistically in all children seen.

Perform a full skin check annually with routine health checks.

If one child in a family is managed for a skin condition, encourage the whole family to be reviewed and treated if appropriate.

Skin infections can be a sensitive topic, and a source of shame.

Make use of local cultural contacts – Aboriginal Health Workers, community elders, or family members to assist with education, and screening of other affected family members.

Ensure respectful language is used.

ENVIRONMENTAL HEALTH TEAM REFERRALS

The Environmental Health (EH) team can provide home visits to assist patients in managing some of the factors that are increasing their risk of skin infections. EH Providers work in every community. Make sure you know who your local EH providers are.

The referral must be with signed patient consent and then sent to the regional provider.

[See EH Referral form](#)

<http://kahpf.org.au/s/kahpf-eh-referral-form>

N.B in MMEX practice software there is an auto document that can be electronically signed and emailed to the appropriate EH service provider.

BACTERIAL SKIN INFECTIONS

Bacterial skin infections commonly present as impetigo (“school sores”) and boils. They are caused by Staphylococcus aureus (‘staph’) and Streptococcus pyogenes (‘strep’) and are contagious. The following should be considered in managing skin infections:

1. Are there signs of systemic illness?

Fever, tachycardia, lethargy? [See Sick Kids protocol](#).

http://kahpf.org.au/s/KAHPF_sick_kids.pdf

2. First presentation or recurrent?

Swabs are not recommended at initial presentation.

Consider swabs if:

- deteriorating despite initial treatment
- recurrent within the last 2 months or systemically unwell.
- coinfection with scabies is a common cause for recurrence
- children aged < 6 months with skin infections not responding to treatment are likely to need admission to hospital.

⚠ Community- acquired methicillin- resistant Staphylococcus aureus (cMRSA) is a staphylococcal bacterial infection that is resistant to commonly used antibiotics.

⚠ It is very common in the Kimberley and is sensitive to trimethoprim/sulfamethoxazole (‘cotrimoxazole’).

⚠ Eradication therapy is no longer used for cMRSA.

⚠ Avoid clindamycin in cMRSA because of known resistance patterns and risk of rapid resistance development.

3. Non pharmacological management

Clean and dress sores. Warm water, soap +/- non adhesive dressing is sufficient.

Triclosan, chlorhexidine and other antibacterial washes are NOT recommended.

Boils must be drained. Incise and drain using appropriate analgesia, debride, irrigate with saline, and apply a non-adhesive absorbent dressing.

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4. Antibiotics

Any sore with purulence ('pus') or crusting needs systemic antibiotic treatment. See "Pharmacological Management" on page 2

5. Assess for coinfection with scabies

Superimposed bacterial infection on scabies is common; it is important to recognise and treat BOTH conditions. See "SCABIES" on page 3.

6. Screen for complications, especially if recurrent.

Complications include:

- APSGN characterised by high blood pressure, haematuria, facial swelling. See <http://kams.org.au/wp-content/uploads/2016/11/Acute-Post-Streptococcal-Glomerulonephritis-APSGN.pdf>
- ARF / RHD characterised by: sore joints, fever and heart murmur. See <http://kams.org.au/wp-content/uploads/2017/04/Rheumatic-Heart-Disease-October-2016.pdf>.

Note complications may occur several weeks after strep infection.

7. Contact management

Screen respectfully for any household members with infected skin sores.

Arrange treatment for all household members with sores or scabies.

8. Environmental health management

Discuss home environment, confirm access to running water and soap.

Refer to the EH team as per page 1.

9. Arrange review / follow up at 48 hours, and 1 week.

Ensure whole household has been screened.

Screen for complications as for step 6 above.

10. Refer/Discuss

- Systemic signs of illness (fever, tachycardia, unwell).
- Any skin condition that does not improve as expected.
- Patient groups for specific consideration:
 - Medication allergies,
 - children < 6 months,
 - immunosuppressed.

Pharmacological Management

IM benzathine penicillin, single dose (see dosing table 1) OR oral trimethoprim / sulfamethoxazole twice daily for 3 days. (see dosing table 2) OR oral trimethoprim / sulfamethoxazole once daily for 5 days. (see dosing table 3).

Use trimethoprim / sulfamethoxazole in cases of penicillin allergy or MRSA previously identified on swab.

If allergic to penicillin and sulfurs: consult senior doctor.

⚠ Do NOT use topical antibiotics.

Table 1: Dosing for recommended antibiotics in children

Weight	IM dose of benzathine penicillin (1.2 million units/2.3ml)
< 6 kg	0.6ml (discuss with a doctor prior to administration)
6 to <8g	0.45 million units (0.9 mL)
8 to <10kg	0.45 million units (0.9 mL)
10 to <12kg	0.45 million units (0.9 mL)
12 to <16kg	0.6 million units (1.2 mL)
16 to <20kg	0.9 million units (1.7 mL)
20 to <25kg	1.2 million units (2.3 mL)
25 to <32kg	1.2 million units (2.3 mL)
32 to <40kg	1.2 million units (2.3 mL)
40kg + / adult	1.2 million units (2.3 mL)

Minimise pain with IM benzathine penicillin injections:

1. Buzzy bee <https://buzzyhelps.com/>
2. Mix with lignocaine
3. Ventrogluteal site with correct technique

Table 2. Weight band dosing for oral co-trimoxazole (4mg/kg/dose of trimethoprim component) twice daily for 3 days

Weight	Syrup Dose (Give morning & night) Cotrimoxazole syrup is 40mg trimethoprim/5mL	Tablet Dose (Give morning & night)
3 -< 6 kg	1.5 mL (12mg BD)	N/A
6 to <8g	3 mL (24 mg BD)	N/A
8 to <10kg	4 mL (32 mg BD)	N/A
10 to <12kg	5 mL (40 mg BD)	N/A
12 to <16kg	6 mL (48 mg BD)	N/A
16 to <20kg	8 mL (64 mg BD)	N/A
20 to <25kg	10 mL (80 mg BD)	N/A
25 to <32kg	12.5 mL (100 mg BD)	½ tablet
32 to <40kg	16 mL (128 mg BD)	¾ tablet
≥ 40kg	20 mL (160 mg BD)	1 tablet

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Table 3. Weight band dosing for oral co-trimoxazole (8mg/kg/dose of trimethoprim component) once daily for 5 days

Weight	Syrup Dose Cotrimoxazole syrup is 40mg trimethoprim/5mL	Tablet Dose
3 -< 6 kg	3 mL (24 mg OD)	N/A
6 to <8g	6 mL (48 mg OD)	N/A
8 to <10kg	8 mL (64 mg OD)	N/A
10 to <12kg	10 mL (80 mg OD)	N/A
12 to <16kg	12 mL (96mg OD)	N/A
16 to <20kg	16 mL (128 mg OD)	N/A
20 to <25kg	20 mL (160 mg OD)	1 tablet
25 to <32kg	24 mL (200 mg OD)	1½ tablet
32 to <40kg	32 mL (256 mg OD)	1½ tablet
≥ 40kg	40 mL (320 mg OD)	2 tablets

FUNGAL SKIN INFECTIONS

Tinea, also called ringworm, is common in children. Tinea of the feet (tinea pedis) occurs commonly in adults and less so in children.

Standard treatment for recent onset of localised tinea of the trunk, limbs, face, or between the fingers or toes is: terbinafine 1% (adult and child) cream or gel topically, once or twice daily for 7 to 14 days.

Oral antifungal therapy is appropriate for tinea that:

- is widespread or established (particularly on the feet)
- has not responded to topical antifungal therapy
- recurs soon after treatment
- has been inappropriately treated with a topical corticosteroid
- is on the scalp (tinea capitis), palms or soles
- is inflammatory, hyperkeratotic or vesicular.

These conditions require skin scrapings and discussion with a doctor for oral treatment as per eTG Complete.

How to take a skin scraping:

Use blunt edge of disposable scalpel.

Scrape raised edge of scaly patch and collect as many skin flakes as possible in a plastic specimen jar.

Send for fungal microscopy and culture.

Pityriasis versicolor is a common yeast infection of the skin in which flaky discoloured patches appear on the chest and back.

It can be treated by selenium sulphide or ketoconazole shampoo applied to wet skin for 10 mins before bathing, daily for one week.

SCABIES

Scabies is a condition affecting a household, not just an individual. The causative agent is a mite. Small itchy lumps appear as the body reacts to the mites. Tracks of the mite can often be seen in between fingers and toes. Pharmacological treatments do not kill the mites' eggs, so re-treatment in one week is needed to interrupt the life cycle.

Principles of scabies management:

1. Are there signs of systemic illness?

Fever, tachycardia, lethargy? [See Sick Kids protocol.](#)

http://kahpf.org.au/s/KAHPF_sick_kids.pdf

Children aged < 6 months with skin infections not responding to treatment are likely to need admission to hospital.

2. First presentation or recurrent?

Ensure everyone in the house has been treated including new visitors staying overnight.

Screen for a crusted scabies contact.

Consider second line therapy.

3. Assess for bacterial coinfection

If present, treat as for "Bacterial Skin Infections" on pg 1.

4. Differentiate between "CRUSTED SCABIES" on page 4 and simple scabies with bacterial co-infection.

Consider confirmation of diagnosis by dermatoscopy or skin scraping if unusual presentation or not responsive to treatment. Simple scabies does not need testing.

5. Antiparasitic agent

See Pharmacological Management.

6. Manage itch

Manage itch to decrease risk of secondary infection.

Itch may persist for 2-4 weeks after successful treatment.

Ensure fingernails are short and clean, and skin is well moisturised.

Offer oral antihistamine, or weak topical corticosteroid.

7. Contact management

Arrange treatment for all household members. Any household members with clinical scabies should receive a full treatment course with a second treatment application in one week.

Screen respectfully for any household members with crusted scabies especially elderly/ people who aren't coming to clinic much.

8. Environmental health

Discuss home environment, confirm access to running water and soap. Refer to "Environmental Health Team Referrals" on page 1.

9. Arrange review at 1 week

Repeat the pharmacological treatment to kill newly hatched mite eggs and break the mite life cycle.

Ensure whole household has been treated. Any household members with clinical scabies should receive a second treatment application.

If skin sores present screen for complications as per page 2.

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Pharmacological Management

First line management:

Topical permethrin 5% cream, to whole body, left on overnight. See “How to use” box. Permethrin is safe to use in all age groups.

How to use permethrin cream:

1. Everyone living in the household must be treated at the same time. Speak to AHW/EHW on how to achieve this.
2. Needs to be left on overnight, so rub on clean dry skin after a shower.
3. Start with the head, and rub into scalp and apply behind ears.
4. Can be applied to face, but not eyes and mouth.
5. Then apply carefully down the whole body, include fingers and toes, soles of feet, under nails, body and joint creases.
6. Put on hands again after washing, and put on hands again before bed.
7. Repeat application one week later.

Second line management:

Oral ivermectin is recommended if topical treatment fails or is contraindicated.

Dose as per table 2 on day 1 and again in 1 week. Oral ivermectin cannot be used in children less than 5 years of age or under 15 kg, and in pregnant or breastfeeding women.

Table 4: Weight band dosing for ivermectin (200mcg/kg)*

Weight	Dose:
1 tablet contains 3mg of ivermectin	
15 to <25kg	1 tablet (3mg)
25 to <35kg	2 tablets (6mg)
35 to <55kg	3 tablets (9mg)
55 to <65kg	4 tablets (12mg)
65 to 80kg	5 tablets (15mg)
80kg +	6 tablets (18mg)

from National Healthy Skin Guideline

CRUSTED SCABIES

Crusted scabies is a severe, serious and highly infectious form of scabies, with much greater numbers of scabies mites infesting the skin, and (in its most severe form) a hyperkeratotic dermatosis causing the crusting appearance.

Because of shame about appearance, scabies, and fear of hospitalisation people often won't present for treatment.

A respectful approach to suspecting and screening for this, particularly when household contacts are re-presenting with recurrent scabies, will increase identification of cases.

Discuss treatment with a senior doctor or physician/paediatrician; it involves oral ivermectin with a regimen of topical keratolytics and antiparasitics.

Crusted scabies is a highly communicable disease and requires a multi-team approach. Discuss management options with Kimberley Disease Control team and make an environmental health referral to assist the family to treat the household.

HEAD LICE

Head lice are tiny wingless insects that live on the scalp and feed on human blood. They are spread by direct hair to hair contact. ‘Nits’ is the common name for the eggs laid by head lice. Live nits are yellow-white in colour and attach to the hair close to the scalp. Dead nits are darker and found well away from the scalp.

Head lice and insect bites are important contributors to skin infections as scratching may cause breaks in the skin allowing entry of bacteria. The persistent itch caused by head lice may also contribute to sleep problems, tiredness, poor school attendance and poor concentration.

Treatments should be according to instructions on the packet. Dimethicone 4% works by smothering the head lice. These products are safe alternatives to insecticidal preparations recommended in eTG Complete, have no documented evidence of resistance and can be used repeatedly.

1. Principles of head lice management: Check for live lice.

If seen, start treatment. If no live lice seen comb the hair, apply conditioner to dry hair and comb with a fine tooth comb. Wipe comb on a tissue after each stroke and check for live lice. If live lice found, start treatment. Look for infected sores and if found, treat (see "Bacterial Skin Infections" on page 1).

2. Treat by completely covering clean dry hair with dimethicone 4% spray. Leave on for ≥15 minutes.

Wash out of hair with regular shampoo. Apply conditioner to dry hair and use a fine-tooth comb to remove dead lice. If using other dimethicone formulations follow product instructions. There is no clinical need to shave the head.

3. Household and family members should be checked and treated if live lice identified and treated at the same time.

Ask the family to notify the school or childcare centre. Children who have commenced treatment as above may continue to attend school or childcare.

4. Follow up with recall in 1 week for repeat dimethicone 4% treatment to cover any nits that have hatched.

Encourage family to continue daily fine-tooth combing between treatments.

5. Prevent by washing brushes and combs in hot soapy water.

Hot wash clothing and bedding used in the preceding 2 days. Keep hair short or tied back/braided. People with head lice may not always have symptoms, so it is important to routinely inspect for head lice.

6. Refer/discuss.

If head lice persists despite proper treatment technique and treatment of contacts discuss alternate treatment options with senior doctor i.e. insecticidal or mechanical (wet combing method- refer to eTG). If the child is less than 6 months of age, discuss use of dimethicone 4% with a senior doctor.

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RESOURCES:

National Healthy Skin Guideline, Telethon Kids Institute:

<https://infectiousdiseases.telethonkids.org.au/siteassets/media-docs---wesfarmers-centre/national-healthy-skin-guideline---1st-ed.-2018.pdf>

Head lice Fact Sheet NT

<https://nt.gov.au/wellbeing/health-conditions-treatments/parasites/head-lice>