

# Skin Infections

## CASE DEFINITION

Skin infections in the Kimberley contribute to significant illness, including severe sepsis. Skin infections may be viral, fungal, bacterial or parasitic.

**Bacterial skin infections in children are a particular concern, they can lead to:**

- Acute Post Streptococcal Glomerulonephritis (APSGN).
- Acute Rheumatic Fever (ARF)/ Rheumatic Heart Disease (RHD) (see ARF and RHD protocols).
- Osteomyelitis.
- Disseminated Staphylococcal infection.

## SCREENING

- Examine skin opportunistically in **all children** when they are seen at the clinic.
- Offer a full skin check annually with routine health checks.

## PRINCIPLES OF MANAGEMENT:

See information under specific skin infections below. There can be more than one type of problem present at the same time: *remember to think of and treat all contributing/co-existing skin infections.*

### When to swab?

Swabs are generally not required in initial management of skin infections.

A swab result may aid management if there are **persistent** (still present at 48 hour review), **deteriorating, recurrent** (within 2 months) or **severely infected** skin sores (extensive, systemic signs).

## THERAPEUTIC PROTOCOLS:

### BACTERIAL INFECTIONS (*Boils and Skin Sores*):

Types of bacterial skin infections include: boils, carbuncles, abscess, cellulitis, impetigo (school sores), erysipelas, infected scabies, ecthyma, erythema, skin sores.

Group A Streptococcal (GAS) infection usually precedes infection with Staphylococcal (staph) organisms in the tropics.

An intramuscular injection of benzathine penicillin (LA Bicillin) both treats the GAS infection AND reduces the chance of serious complications including APSGN and ARF/RHD.

### MANAGEMENT:

#### Non-pharmacological management:

- If a pus collection (boil) is present, incise and drain, debride, irrigate and apply a non-adhesive absorbent dressing.
- Clean skin sores and apply dressing to reduce transmission within the community.
- DO NOT USE topical antibiotics i.e. mupirocin (Bactroban), fusidic acid etc.
- Review for resolution within 48 hours.
- Assess and treat other household members as needed.

#### Antibiotics:

Have a low threshold to treat with an injection of benzathine penicillin (LA Bicillin), particularly in children  $\leq 17$  years of age to prevent APSGN/ARF RHD.

Use antibiotics if:

- More than one sore.
- Associated with head lice, scabies or tinea.
- Local spread into subcutaneous tissue (cellulitis) or systemic signs of illness (fever, tachycardia, unwell) - for children refer to: Assessing the Unwell Child Protocol.
- Sores are **persistent** (still present at 48 hours), **deteriorating, recurrent** (within 2 months) or **severe**.

## SEE FLOWCHART

### 1. Initial treatment:

Injection of benzathine penicillin (LA Bicillin) IM, as a single dose OR oral co-trimoxazole.

See table below for dosing.

Check allergies.

*If allergic to penicillins, use co-trimoxazole.*

*If allergic to penicillins and sulphurs, discuss with doctor - consider Roxithromycin for 5 days (4mg/kg to maximum 150mg twice daily)*

Weight(KG)	Dose of LA Bicillin(900mg/2.3mL)*
<6	Discuss with doctor
6 to <10	0.75mL
10 to 15	1mL
15 to <20	1.5mL
20 or more	2.3mL
*Give as IM injection - ask for help if not confident to give the injection	

	Dose of co-trimoxazole (trimethoprim + sulfamethoxazole)*
Child (up to 40kg)	200mg/ 40mg per 5mLs suspension 20+4mg/kg/dose =0.5mL/kg/dose twice daily for three days OR 40+8mg/kg/dose =1mL/kg/dose daily for 5 days**
Adult	160+800mg twice daily for five days
Renal impairment	80+400mg twice daily for five days (eGFR <50mL/min)
* Check for sulphur allergies ** Consider once daily dosing if expected to improve adherence	

# Skin Infections

## 2. Recurrent or not responding to above treatment:

Consider: adherence to treatment; underlying triggers (eg scabies or diabetes); community-acquired Methicillin Resistant Staphylococcus aureus (cMRSA); reinfection.

Take a swab and call senior doctor to discuss.

### Without laboratory (swab) results:

If initial treatment with LA Bicillin, treat with oral co-trimoxazole. Check for sulphur allergy before prescribing. See table above for dosing.

If initial treatment was with oral co-trimoxazole, discuss with doctor. Alternative antibiotic (as above), admission or daily observed treatment in clinic may be recommended.

### If recurrent or not responding to treatment in a child less than 6 months of age, admit to hospital for treatment.

### With laboratory (swab) results:

- Check sensitivities & discuss with doctor.
- If cMRSA confirmed avoid clindamycin because resistance will develop rapidly.

### What is cMRSA:

This is *Staphylococcal* bacterial infection that is resistant to the antibiotics we commonly use to treat skin infections. Community-acquired Methicillin Resistant Staphylococcus aureus (cMRSA) is common in the Kimberley.

### Risk factors for cMRSA:

- Recurrent skin sores/infection despite adequate treatment.
- Exposure to household contacts with cMRSA.
- Prior cMRSA on swab (document MRSA results clearly in a patient's file).
- Overcrowded home environment, sharing bed linen.

### cMRSA Eradication/ Decolonisation treatment:

**Do not attempt decolonisation before discussion with a senior doctor.**

### Refer for consideration of decolonisation if:

- Recurrent cMRSA infections occur in individual or multiple individuals from the same household.
- Increased risk of serious systemic infection (eg immunosuppressed, chronic disease).

### Decolonisation treatment:

- Is most effective when all regular household members participate.
- Requires daily washing with chlorhexidine gluconate 4% for 5 days: put in bath/shower for use by ALL household members.
- Give nasal mupirocin 2% ointment (Bactroban) twice daily for 5 days. Only if adherence likely.

See [www.health.wa.gov.au/community-mrsa](http://www.health.wa.gov.au/community-mrsa) for patient handouts and more information.

### SCABIES

Scabies is caused by a parasitic mite that spreads from person to person following close physical contact. The body reacts to the presence of the scabies mites, this leads to small, itchy lumps that can appear anywhere on the body. Commonly the trunk, wrists, elbows, knees and genitals.

In infants they can appear as blistering lesions on the hands and feet.

GAS skin sores often develop secondary to a scabies infection.

### MANAGEMENT:

#### Initial treatment:

#### 1. TREAT THE INFECTED PATIENT

##### Children under 2 months:

- Call senior doctor to discuss.
- Treat any secondary infection.
- Crotamiton 10% cream (Eurax) over the whole body (avoid mouth, eyes, nose, hands). Avoid use on open or infected sores. Apply twice daily for 3 days.

### Children over 2 months and adults:

- Treat any secondary infection as above.
- Permethrin 5% (Lyclear) cream to the whole body from the neck down, avoiding eyes, after a bath/shower. Leave on overnight. Avoid use on open or infected sores.
- Repeat application one week later.
- If itch is intense, offer antihistamine until it settles.
- If many sores are present, consider ivermectin (see next section).

*Itch may persist for 2-4 weeks even after successful scabies treatment, due to ongoing immune reaction. Trial moisturiser, antihistamine or weak topical corticosteroids.*

#### 2. TREAT CLOSE CONTACTS/ HOUSEHOLD MEMBERS

- Offer same treatment as above simultaneously to close contacts and other household members (especially if any itch or signs of scabies).

#### 3. TREAT THE HOME ENVIRONMENT

- Recommend washing bedding/ clothing on day of treatment. If no access to washing facilities, suggest sitting mattresses, clothing and bedding inside plastic bags in the hot sun.
- For repeated scabies infection, discuss treatment of the home with local environmental health staff.

#### 4. ENSURE RE-TREATMENT AND REVIEW

- Ensure re-treatment with permethrin after one week as above.
- Review until no new lesions appear.

### Persistent/recurrent scabies:

- Call senior doctor to discuss
- Consider treatment with oral ivermectin 200mcg/kg, round up to nearest 3mg (see table below). Repeat dose after one week.

If persists, discuss with paediatrician or physician.

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Weight (Kg)	Dose of ivermectin (200mcg/kg rounded up to nearest 3mg)
<15kg	Not recommended
15-24kg	3mg
25-35kg	6mg
36-50kg	9mg
51-65kg	12mg
66-79kg	15mg
≥80kg	200mcg/kg

Advise patient to take with food. Do not give if patient may be pregnant or in severe liver disease. Caution if patient frail or likely to become confused.

## Crusted Scabies

-This is a severe and serious form of scabies, usually associated with concurrent chronic disease/ immunosuppression.

-Crusted scabies needs more extensive treatment.

-If you have a case of crusted scabies, seek specialist input (paediatrician or physician) early.

## HEAD LICE

Head lice is common, particularly in school aged children. The lice themselves are harmless, but if there has been extensive scratching and the skin has been broken, then secondary bacterial infection may occur.

For treatment refer Head Lice Protocol

## TINEA / RINGWORM

Tinea is a fungal infection which may affect almost any area of skin. It is known by many names, including Tinea capitis (scalp infection) and Tinea corporis (infection on the body or ringworm).

For pictures see: [www.dermnetnz.org](http://www.dermnetnz.org)

The diagnosis may be made based on appearance, but if there is uncertainty or the infection is recurrent, persistent or severe, a skin scraping should be taken to confirm the diagnosis.

## How to take a skin scraping

- Use the blunt edge of a disposable scalpel
- Scrape the raised edge of the scaly patch and collect flakes of the skin in a plastic specimen jar (as many flakes as possible)
- Avoid bleeding - scraping should be firm but along the surface of the skin, not into the skin
- Send for fungal microscopy & culture

## MANAGEMENT:

### For small areas of skin:

- Avoid sharing towels/foot wear whilst infection active.
- Apply a topical antifungal agent (ketoconazole 2%, clotrimazole 1% or terbinafine 1% cream) twice daily until the infection has cleared, and then continue for one more week.

### For larger areas on the body, or tinea on the scalp or nails:

- Take a skin scraping or nail cutting to confirm the diagnosis.
- Discuss with doctor to consider treatment with oral medications like Terbinafine or Griseofulvin.

## TINEA VERSICOLOR

Tinea versicolor is more of a "yeast" type of fungal infection that may result in light patches appearing on dark skin or dark patches appearing on light skin. It is not contagious. There may be some itch but in most cases it is asymptomatic.

If the person is bothered by symptoms, treat with selenium sulphide (Selsun) or ketoconazole shampoo applied topically to wet skin, left on for at least 60 minutes before bathing, daily for one week.

## FOLLOW UP

**Review** regularly until skin infections are resolved. Skin colour can take months to return to normal after a skin infection.

## Hansen's Disease (Leprosy) still exists in the Kimberley. This can masquerade as tinea.

Discuss with senior doctor if a skin lesion:

- Is not responding to treatment as expected
- Is associated with sensation changes
- Occurs in someone with a history in the family contacts of Hansen's Disease.

**Recall** for follow up after completion of any treatment, especially if treated with antibiotics.

**Provide education** to family members about skin care, prevention and early management of skin infections.

**Check** other members of the household.

## DISCUSS WITH SENIOR DOCTOR

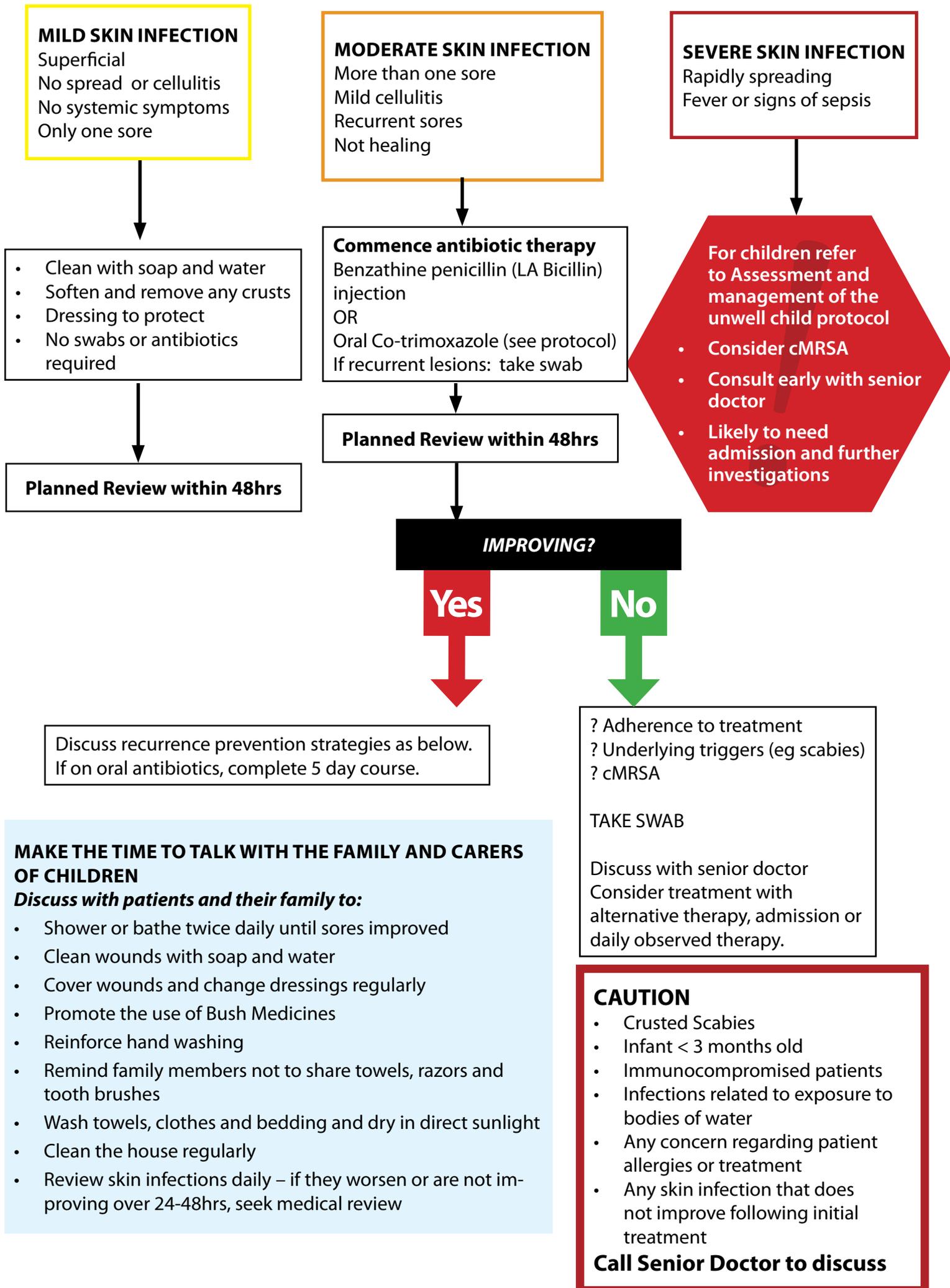
- Crusted scabies
- Infant <3 months old
- Immunocompromised patients
- Infections related to exposure to bodies of water
- Any concerns related to patient allergies and medication
- Any skin infection that does not improve following initial treatment
- Not improving as expected

Offer the local referral process for environmental health assessments that will help families with home environment problems e.g. broken shower to be fixed. See flow chart for additional environmental interventions.

## USEFUL RESOURCES

<http://www.lowitja.org.au/sites/default/files/docs/Healthy-Skin-Flipchart-Aug09.pdf>

# MANAGEMENT OF BACTERIAL SKIN INFECTIONS IN THE KIMBERLEY



## MILD SKIN INFECTION

Superficial  
No spread or cellulitis  
No systemic symptoms  
Only one sore

- Clean with soap and water
- Soften and remove any crusts
- Dressing to protect
- No swabs or antibiotics required

**Planned Review within 48hrs**

## MODERATE SKIN INFECTION

More than one sore  
Mild cellulitis  
Recurrent sores  
Not healing

### Commence antibiotic therapy

Benzathine penicillin (LA Bicillin) injection  
OR  
Oral Co-trimoxazole (see protocol)  
If recurrent lesions: take swab

**Planned Review within 48hrs**

## SEVERE SKIN INFECTION

Rapidly spreading  
Fever or signs of sepsis

For children refer to Assessment and management of the unwell child protocol

- Consider cMRSA
- Consult early with senior doctor
- Likely to need admission and further investigations

**IMPROVING?**

**Yes**

**No**

Discuss recurrence prevention strategies as below.  
If on oral antibiotics, complete 5 day course.

? Adherence to treatment  
? Underlying triggers (eg scabies)  
? cMRSA

TAKE SWAB

Discuss with senior doctor  
Consider treatment with alternative therapy, admission or daily observed therapy.

## MAKE THE TIME TO TALK WITH THE FAMILY AND CARERS OF CHILDREN

### Discuss with patients and their family to:

- Shower or bathe twice daily until sores improved
- Clean wounds with soap and water
- Cover wounds and change dressings regularly
- Promote the use of Bush Medicines
- Reinforce hand washing
- Remind family members not to share towels, razors and tooth brushes
- Wash towels, clothes and bedding and dry in direct sunlight
- Clean the house regularly
- Review skin infections daily – if they worsen or are not improving over 24-48hrs, seek medical review

## CAUTION

- Crusted Scabies
- Infant < 3 months old
- Immunocompromised patients
- Infections related to exposure to bodies of water
- Any concern regarding patient allergies or treatment
- Any skin infection that does not improve following initial treatment

**Call Senior Doctor to discuss**