

# Fiji Guidelines for Sore Throat and Skin Disease

**Diagnostic and Treatment Guidelines  
(October 2018)**



# Fiji Sore Throat and Skin Disease

## Diagnosis and Treatment Guidelines

### Executive summary

- Group A streptococcal (GAS) sore throat is most common in children, and accounts for approximately 20% of all causes of sore throat.
- Untreated GAS sore throat can lead to acute rheumatic fever and subsequent rheumatic heart disease. Treatment of GAS sore throat prevents acute rheumatic fever.
- Scabies (*karokaro*) and skin sores are endemic in Fiji, predominantly affecting children.
- Untreated skin sores can lead to serious disease, possibly even rheumatic fever.

### Sore throat

- Common symptoms and signs of GAS sore throat include sore throat, fever and swollen cervical glands.
- The gold standard for diagnosis is culture of a throat swab to detect GAS.
- In the absence of laboratory testing, clinical decision rules can be used for GAS sore throat diagnosis.
- It is recommended the Fiji clinical decision rule version is used for children and young people with a sore throat to determine whether they should be offered treatment.

### Treatment of GAS sore throat

- Treatment of GAS sore throat is with antibiotics.
- A single dose of intramuscular benzathine penicillin G is preferred therapy (see table 1)
- Patients should be isolated from school for 24 hours after antibiotic treatment to reduce the spread of GAS bacteria to other children.

**Table 1 Antibiotic treatment for GAS sore throat**

|   |
|---|
| <b><u>Recommended first-line regimen</u></b><br>Single dose of intramuscular Benzathine Penicillin G<br><30 kg: 600,000 U given intramuscular as a single dose<br>≥30 kg: 1,200,000 U given intramuscular as a single dose  |
| <b><u>Alternate oral antibiotic regimen (second-line)</u></b><br><i>1st line oral agent:</i><br>Penicillin (Phenoxymethylpenicillin V)<br>< 10 years: 250mg orally twice daily for 10 days<br>> 10 years: 500mg orally twice daily for 10 days<br><i>2nd line oral agent:</i><br>Cephalexin 20 mg/kg/dose twice daily (max 1 g per day) for 10 days |
| <b><u>Anaphylaxis to beta-lactam antibiotics (penicillin and/or cephalosporins)</u></b><br>Erythromycin 20 mg/kg/dose twice daily orally for 10 days<br>(maximum paediatric dose 500mg and adult dose 1000mg/day)   |

### Skin disease (Impetigo)

#### Diagnosis

- Diagnosis of Impetigo is based on clinical examination using the Fiji IMCI skin disease guidelines.
- The IMCI skin validated guidelines have been adapted for use in children and young people.

#### Treatment

- Evidence based treatment of skin disease/skin sores is a single dose of IM benzathine penicillin G (first line) or 5 days of oral Co-trimoxazole.
- First line antibiotic treatment: Benzathine Penicillin deep intramuscular injection (see Table 2) .
- Second line antibiotic treatment: Co-trimoxazole Syrup 4+ 20mg/kg BD for 5 days

**Table 2:** IM doses: Benzathine penicillin G 2.4 million units per vial. (Mix with 8mls water for injection to make 10mls.)

| Age in months. | Weight in kg. | Dose in units. | Volume in mls |
|----------------|---------------|----------------|---------------|
| 0 -3           | 2.5 – 5.9     | 300,000.       | 1.3           |
| 4 - 12         | 6 – 10        | 450,000.       | 1.9           |
| 13 - 36        | 11 – 14       | 600,000.       | 2.5           |
| 37 - 60        | 15 – 18       | 900,000.       | 3.8           |
| >60            | > 18          | 1,200,000.     | 5.0           |

*The Sore Throat and Skin Disease Guidelines are published by the Fiji RHD Control and Prevention Programme within the Wellness Unit of the Fiji Ministry of Health as part of a series of guidelines for diagnosing and managing Acute Rheumatic Fever and Rheumatic Heart Disease, also available on the Fiji Guideline Host app.*

## Scope and Purpose of the Guideline

The purpose of this document is to provide an evidence-based guideline for best practice of the management of patients presenting with sore throat and skin disease in the Fiji health system. The guideline is intended for health professionals in community, public health, primary and secondary care settings. A key aim of these guidelines is to improve the diagnosis and management of group A streptococcal (GAS) sore throat to prevent rheumatic fever. The guideline also aims to minimise investigations and antibiotic use where possible.

GAS sore throat (synonymous with GAS pharyngitis and GAS tonsillitis in these guidelines) is the most important bacterial cause of throat infection encountered in primary care because of the morbidity and mortality associated with the sequelae of acute rheumatic fever. The underlying premise is that treatment of GAS sore throat will reduce the incidence of rheumatic fever.

## Disclaimer

The authors do not warrant the accuracy of the information contained in these guidelines and do not take responsibility for any deaths, loss, damage or injury caused by using the information contained herein. While every effort has been made to ensure that the information contained in these guidelines correct and in accordance with current international evidence based clinical practice; the dynamic nature of medicine requires that users exercise in all cases employ independent professional judgment when using these guidelines. The skin disease content has been directly taken from the Fiji MoHMS National IMCI package (updated 2017).

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## Introduction

### ***Rheumatic fever and rheumatic heart disease are important causes of death and disability in Fiji.***

Sore throat caused by the bacterium group A streptococcus (GAS) can lead to acute rheumatic fever and subsequent chronic rheumatic heart disease. Sore throat can also be complicated by more severe infections including peritonsillar abscess (quinsy). Reports of outbreaks of acute rheumatic fever and an increasing incidence of invasive disease in industrialised countries since the 1980s have highlighted GAS as a cause of disease in children in these areas. However, the burden of severe GAS disease is found predominantly in developing countries and impoverished populations living in wealthy countries, where 20% of sore throat cases are cases caused by GAS. An estimated 30 million people currently suffer from rheumatic heart disease with over 300 000 deaths per year.[1] The prevalence of rheumatic heart disease is estimated to be 8 per 1000 children in Fiji.

### ***Treatment of GAS sore throat prevents the development of rheumatic fever.***

Treatment of GAS sore throat has been shown in controlled trials in the 1950's in military recruits in the United States to reduce the risk of subsequent rheumatic fever by approximately 80%.[2] A large public health programme in New Zealand over the past five years that has included an intensive school-based sore throat treatment programme and improved access to treatment for sore throat in local clinics has been able to reduce the incidence of rheumatic fever by some 45%.

### ***Data from Fiji suggest that sore throat caused by GAS occurs frequently in children and can lead to rheumatic fever.***

The incidence of first episode rheumatic fever in children aged 5 to 15 years in Fiji has been estimated to be in the range of 15 to 25 per 100,000.[3, 4] In a prospective study of patients admitted to the Colonial War Memorial Hospital with confirmed acute rheumatic fever, 40% reported a history of sore throat although it is unknown how many of these patients sought care for their sore throat and how many of these cases were caused by GAS. [5]

The incidence of GAS sore throat in children varies from region to region. An active, prospective, cohort surveillance study of sore throat undertaken in Fiji in 2007 found that the incidence of GAS sore throat in Fiji was 14.7 per 100 child-years. While this incidence rate appears similar to rates of GAS sore throat reported from temperate, industrialised settings such as urban Australia (12.8 per 100 child-years), and the United States (15 per 100 child-years), the design of the study in Fiji was quite different and so the results must be interpreted with caution. [6-9] The Fiji sore throat study used active daily surveillance for GAS sore throat in schools (that is, direct questioning of all children at school) while the other studies used passive surveillance of clinics (that is, participants presenting to their primary care physician

with sore throat). Very few of the participants in the Fiji study had clinical signs normally associated with sore throat caused by GAS, including fever (5%), tonsillar exudate (18%) and tender cervical nodes (25%). The incidence of GAS sore throat in Fiji in patients presenting to health services with the complaint of sore throat is not known.

## Skin disease

Skin diseases are common in Fiji. Common skin conditions in Fiji that affect children are generally caused by infection and include impetigo (bacterial skin sores), scabies, fungal infection, cellulitis and abscesses. Skin infection can be severe and life-threatening. It can act as portal of entry for bacteria that can lead to septicaemia and death.

Scabies is recognised as a major public health problem in many countries, and is responsible for significant morbidity due to secondary bacterial infection of the skin causing impetigo, abscesses and cellulitis, that can in turn lead to serious systemic complications such as septicaemia, kidney disease and, potentially, rheumatic heart disease. A recent study undertaken in Fiji found that the prevalence of scabies was 23.6%, and when adjusted for age structure and geographic location based on census data, the estimated national prevalence was 18.5%. The prevalence was highest in children aged five to nine years (43.7%), followed by children aged less than five (36.5%), and there was also an indication of prevalence increasing again in older age. The prevalence of scabies was twice as high in iTaukei (indigenous) Fijians compared to Indo-Fijians. The prevalence of impetigo was 19.6%, with a peak in children aged five to nine years (34.2%).<sup>[10]</sup> It is hypothesized that reducing the burden of skin disease may lead to a reduction in rheumatic fever.

## Primary prevention

**Primary prevention** is a strategy that seeks to prevent disease occurring in the first instance rather than treating it once it has developed. In the case of rheumatic fever this means treating GAS sore throat before it can initiate rheumatic fever.

The role of GAS skin infection in causing rheumatic fever is controversial, but has been proposed by some experts. There is currently no evidence to confirm or refute a link between skin infections and rheumatic fever. This guideline only deals with management of sore throat.

**Primordial prevention** refers to the social and environmental risk factors that could be improved to decrease the effect of GAS infection on the population. These factors include household overcrowding, poor living conditions, malnutrition and poor sanitation.



## Diagnosis of GAS pharyngitis/sore throat

A sore throat is usually a symptom of a bacterial or viral infection. The immune system will normally fight off the infection without the need for medical treatment. Sore throat is a common symptom for colds and the flu, both of which are viral infections. It can be difficult to tell the difference between bacterial and viral sore throats. Antibiotics are only needed if the infection is caused by bacteria and in the case of sore throat this means the bacteria GAS. Therefore it is important to try to differentiate between sore throat caused by viruses and GAS.

### Use of throat swabs in diagnosis

The gold standard test for GAS sore throat is largely accepted to be a throat swab that is “positive” for GAS. [8] The most reliable strategy is inoculation of a throat swab onto a sheep-blood agar plate – this technique has a 90-95% sensitivity for detection of GAS.[11]

Taking a throat swab and transporting it to a facility with bacterial culture capability is logistically difficult for most health centres in Fiji. Culture results are not available for at least 24 hours and communication of the results to the patient may be challenging. Based on receipt of swabs at the major government diagnostic microbiology laboratory in Fiji (Colonial War Memorial Hospital, Suva) throat swabbing in Fiji is very rarely performed within the government health care system.

An alternate strategy is testing the throat swab using a rapid antigen detection test. The key advantage of these rapid tests is their faster turnaround time (usually under 1 hour). However, most rapid tests have a lower sensitivity to detect GAS than culture. Rapid tests are not available in Fiji and at this stage are unlikely to be used because of prohibitive cost.

There are very few countries with endemic rheumatic fever that utilise routine microbiological testing or rapid antigen tests due to the costs and logistics involved.[12]

### Clinical decision rules for diagnosing GAS pharyngitis

The majority of cases of sore throat (80%) are caused by viral infections that do not benefit from antibiotic treatment. Distinguishing viral sore throat from GAS sore throat is difficult but important. Clinically there is significant overlap in the symptoms and signs of GAS sore throat and sore throat due to other causes. Features that increase the likelihood of GAS aetiology include age five to twelve years, sudden onset of sore throat, fever, tender and enlarged anterior cervical nodes, abdominal pain, headache, petechiae (red spots) on the palate and tonsillo-pharyngeal erythema and exudate. [13, 14] Features suggestive of a viral aetiology include absence of fever, conjunctivitis, coryza, diarrhea, infection of the mouth (stomatitis), painful swallowing, and ulcerative tonsillo-pharyngeal lesions. Attempts

to combine these features into an algorithm for the clinical diagnosis of GAS sore throat have had relatively low sensitivity and specificity compared to bacteriological diagnosis.[12, 15, 16]

Clinical decision rules using selected signs and symptoms have been developed to predict the probability of GAS as the cause of sore throat without the use of laboratory tests, but few have been evaluated in regions where rheumatic fever is common. In well-resourced settings, often with a low risk of rheumatic fever, clinical decision rules are largely utilised to assist clinician diagnosis to exclude GAS sore throat with the aim of reducing unnecessary antibiotic prescriptions (that is, high specificity). In these settings clinical decision rules are used as a gateway to testing, either by throat swab culture or by rapid antigen testing. In resource-poor settings with a high risk of rheumatic fever, a clinical decision rule should have high sensitivity so that a diagnosis of GAS sore throat is not missed while maintaining reasonable specificity, especially in the absence of adequate laboratory facilities. Therefore the rationale for a clinical decision rule is different depending on the setting.

### The Fiji clinical decision rule

Fiji has with experience using a clinical decision rule for sore throat management as part of the WHO Integrated Management of Childhood Illness (IMCI) algorithms. These IMCI algorithms have been widely used in Fiji since 2003 but only for children aged 5 years and under (the target population for IMCI).

Table 1 compares the sensitivity and specificity results using the WHO clinical decision rule (as included in IMCI for children aged <5 years) with the sensitivity and specificity achieved using an updated Fiji clinical decision rule, when applied to data collected in Fiji school children.

**Table 3: Fiji pharyngitis data from school children assessed using WHO and alternate CDR.**

| CDR    | Criteria = Sore throat plus             | Sensitivity (%) | Specificity (%) |
|--------|---|-----------------|-----------------|
| WHO    | large nodes <u>and</u> exudate          | 1.5%            | 98%             |
| Fiji * | no runny nose <u>or</u> no hoarse voice | 85%             | 29%             |

\*combination of criteria tested by Associate Professor Andrew Steer

Essentially using the WHO clinical decision rule means that the vast majority of children with GAS sore throat are not identified and offered treatment (sensitivity 1.5%) while very few children without GAS sore throat are unnecessarily treated with antibiotics (specificity 98%). Application of the Fiji clinical decision rule means a far higher percentage of children with GAS sore throat will be identified and offered treatment (sensitivity 85%) but will also mean a higher percentage of children will be

offered treatment who don't have GAS sore throat (29% specificity) compared to if the WHO clinical decision rule was used.

In view of the very poor diagnostic sensitivity of the WHO clinical decision rule and the much higher sensitivity achieved with the Fiji clinical decision rule the Paediatric CSN has determined that the Fiji clinical decision rule will be used both in this guideline and will also replace the WHO clinical decision rule in the IMCI guidelines for Fiji.

The entry point for the application of the sore throat rule both within the IMCI and these guidelines is the complaint of a sore throat. If the patient has no runny nose **or** no hoarse voice then it is recommended they receive antibiotic treatment.

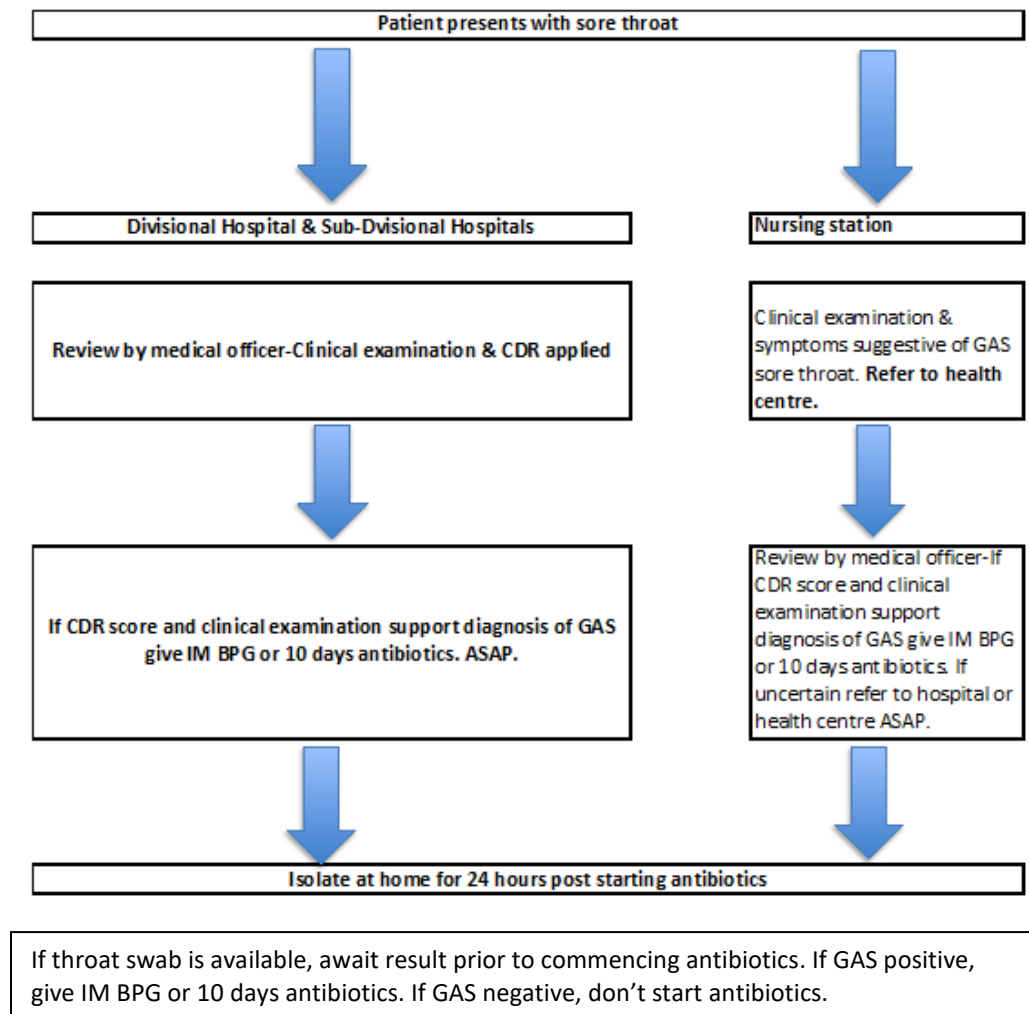
**Treat with antibiotic if a patient presents with a sore throat in the absence of a runny nose or a hoarse voice. If the patient has a runny nose or a hoarse voice, this suggests a viral infection that does not require antibiotic treatment.**

### **Diagnosis of group A streptococcal sore throat in Fiji**

Access to laboratory testing for confirmation of throat swab is currently largely limited in Fiji to the divisional hospitals, and even then it appears that throat swab culture is rarely requested. Figure 1 shows the review and referral pathways for diagnosis and management of sore throat in Fiji.

**We recommend that the clinical decision rule be applied in all cases to aid diagnosis and to confirm the need for testing (where available) and/or antibiotic treatment.**

Figure 1 Algorithm for sore throat management



**§: If throat swab GAS positive:**

All patients should be isolated at home for 24 hours post starting antibiotics

## Management of patients with group A streptococcal sore throat

All Fiji populations are at high risk of ARF so should always have antibiotic treatment when GAS sore throat is confirmed by testing of a throat swab or is suspected on clinical grounds using the Fiji clinical decision rule.

### Which antibiotics should be used in treating GAS sore throat?

The gold standard for treatment of GAS sore throat is injectable long acting benzathine penicillin G. The original trials that demonstrated prevention of rheumatic fever used long acting injectable penicillin.[17, 18]

Oral antibiotics are considered second line as treatment for GAS sore throat. Adherence to a 10 day course of oral penicillin dosed twice per day is recognised as difficult. A number of studies have shown that penicillin V is not as effective at eradicating GAS from the throat when administered once daily or for less than 10 days.[19]

**Table 4 Antibiotic treatment of GAS sore throat**

#### **Recommended first-line regimen**

Single dose of intramuscular Benzathine Penicillin G

<30 kg: 600,000 U given intramuscular as a single dose

≥30 kg: 1,200,000 U given intramuscular as a single dose

#### **Alternate oral antibiotic regimen (second-line)**

*1st line oral agent:*

Penicillin (Phenoxymethyl penicillin V)

< 10 years: 250mg orally twice daily for 10 days

> 10 years: 500mg orally twice daily for 10 days

*2nd line oral agent:*

Cephalexin 20 mg/kg/dose orally twice daily (max 1 g per day) for 10 days

#### **Anaphylaxis to beta-lactam antibiotics (penicillin and/or cephalosporins)**

Erythromycin 20 mg/kg/dose twice daily orally for 10 days

(maximum pediatric dose 500mg and adult dose 1000mg/day)

### **If available, should throat swabs be repeated after antibiotics are completed?**

Throat swabs after treatment are not routinely recommended.

### **How long should patients be excluded from school after starting antibiotics for GAS sore throat?**

It is recommended that patients with school and kindergarten children be isolated at home for 24 hours after starting antibiotics. People with GAS pharyngitis should not share food with other people until 24 hours after antibiotic treatment has been started.

### **Does treating pharyngitis with antibiotics reduce the suppurative complications of GAS pharyngitis (including acute otitis media and peritonsillar abscess)?**

Treating pharyngitis with antibiotics reduces suppurative complications. The number needed to treat is over 200.

### **How should household contacts be managed?**

Swabbing and treatment of household contacts is not routinely recommended. Household contacts with symptoms should be asked to present to their local clinic for assessment.

## **Management of patients with skin disease (including Scabies and Impetigo)**

***NB: this section has been adapted from the Fiji MoHMS IMCI skin module. For further details see Fiji IMCI guidelines 2017.***

### **Rationale for a module for treating skin conditions in children**

The IMCI algorithm addresses the most important causes of serious illness among children aged 1 week to 5 years. In the course of implementing IMCI in Fiji, health workers identified skin conditions as common problems listed under the heading “Assess Other Problems”. Since there was no existing standard guideline for assessing, classifying, and treating skin conditions, the Pilot Project Review in 2004 recommended the development of an algorithm for skin conditions.

A WHO consultant visited Suva, Fiji, in November 2004 to undertake this work. The consultant met with several persons associated with IMCI implementation at the Central and Division Levels of the Ministry of Health, Children’s Unit at the Colonial War Memorial Hospital, and health centres. Based on the reviews and discussions, an algorithm for including skin conditions in IMCI in Fiji was developed and validated, and has since been revised and adapted by local paediatricians.[20] This guideline expands the IMCI algorithm to treat older children and young people presenting with skin disease in Fiji.

## Skin disease in children in Fiji

Available data in Fiji shows that there is a high prevalence of skin conditions in children under the age of 5 years including impetigo and scabies. The Fiji Group A Streptococcal Project in 2006 found the prevalence of impetigo in primary school children in the Central Division to be 36% and scabies to be 18% with some areas having rates of impetigo as high as 80% and rates of scabies as high as 40%. In infants attending Maternal and Child Health Care clinics in 2007 the prevalence of impetigo was 30% and scabies was 15%. In both age groups scabies was often secondarily infected by bacteria leading to impetigo (55% in primary school aged children and 75% in infants).

Scabies is recognized by parent/care givers and health workers but is not recorded as a secondary diagnosis. Parents /care givers believe that scabies and other skin infections are “part of growing up” and often do not seek consultation except when the skin infection worsens. A cross-sectional survey of Otitis Media in Young Children found that 21% of parents attending MCHC clinics reported infected scabies/sores but the actual percentage of infected scabies, as diagnosed by a medical practitioner at the same visit, was 66%.

Skin diseases such as impetigo and scabies can lead to complications. These complications include:

1. Septicaemia caused by the 2 most common bacteria responsible for skin infection (Group A Streptococcus and Staphylococcus Aureus) often occurs as a complication of impetigo
  - ***Septicaemia caused by these bacteria has a very high death rate – therefore early treatment of impetigo is very important***
2. Cellulitis or an abscess can occur if impetigo spreads locally
3. If the impetigo lesions are on the face the infection can spread to the area around the eye – ***bacterial infection around the eye (Periorbital and orbital cellulitis) can lead to septicaemia, blindness, meningitis and brain abscess.***
4. Acute post-streptococcal glomerulonephritis can occur as a post-infective complication of skin sores
5. Acute rheumatic fever may also occur as a complication of skin sores, though this has not been proven

## Bacterial pathogens that cause skin infection

Impetigo in the community is predominantly due to the group A streptococcus (“strep”) and *Staphylococcus aureus* (“staph”). The Fiji Group A Streptococcal Project in 2006 found that from 189 skin swabs taken from primary school-aged children in urban and rural areas of the Central Division in Fiji, group A streptococcus was isolated from 125 (66%) and *Staphylococcus aureus* from 87 (54%) with some sores containing both organisms. All of the group A streptococcal isolates tested were sensitive to penicillin. Over 90% of the *Staphylococcus aureus* isolates tested were sensitive to flucloxacillin and erythromycin but resistant to penicillin.

## INFORMATION ON SKIN DISEASES

It is important to understand the definitions of the different skin diseases to aid in assessment and classification of skin problems.

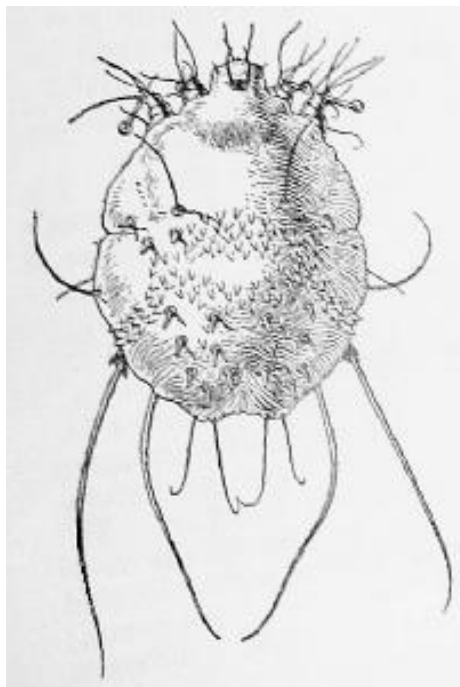
Below are definitions of the seven main skin diseases outlined in this guide and in the algorithm (scabies, infected scabies, impetigo, fungal skin infection, cellulitis, abscess, and periorbital/orbital cellulitis).

Note that there are many other skin conditions that are less common in Fiji or that are covered in other parts of IMCI (for example, measles). There are brief definitions of these skin conditions included in this section – ***as a general rule if you are not sure what the skin condition is, or if you are not sure what the management of a skin condition is, refer to the doctor or skin clinic.***

### Scabies

Scabies is a common skin condition caused by tiny itch mites (see Picture 1). They burrow under the skin and lay eggs which causes itching. The itch mites are very small and so are very hard to see. Scabies causes a red, itchy rash and grayish-white papules in between the fingers, on the elbows, hands, or wrists, under the armpits and other parts of the body. The itching may get worse at night.

Scabies spreads very easily between people. Scabies is spread by touching a person who has scabies. Sharing clothing, towels or a bed can also spread scabies. Scabies is easily spread between people in the one household. The scabies mite does not jump from one person to another and scabies does not come from animals. Untreated scabies can become infected by bacteria and then is often called infected scabies.



**Picture 1: Scabies mite**



### **Impetigo (also called pyoderma or skin sores)**

Impetigo is an infection by bacteria of the top layers of the skin. Impetigo starts as red or pimple-like sores surrounded by reddened skin. The sores can be anywhere on the body, but mostly on the face, arms, and legs. They fill with pus, then break open after a few days and form a crusted scab. Itching is common.

Skin sores are commonly caused by two bacteria – the “staph” and “strep” bacteria. Skin sores are spread by direct contact with sores or nasal mucus from an infected person. Because skin sores are itchy many children will scratch their sores and this scratching can spread the lesions. In tropical conditions germs can be spread easily if personal hygiene is poor and living conditions are overcrowded. Dried strep and staph germs in the air are not infectious to skin with no breaks. The germs can enter broken skin, such as a scratch, cut or insect bite. In Fiji the most common cause of a break in the skin is when a person is infected with scabies. Scabies causes intense itching and scratching and this allows the germs from fingernails to enter the body and cause infection.

### **Fungal skin infections (also called ringworm or tinea)**

The most common fungal skin infection is “ringworm”. Ringworm is a contagious fungal infection that can affect the scalp, the body, the feet, and the nails. Despite its name, it has nothing to do with worms. The name comes from the characteristic red ring that can appear on an infected person's skin. Ringworm is also called Tinea. Ringworm is caused by several different fungi that belong to a group called dermatophytes. Different dermatophytes affect different parts of the body and cause the various types of Ringworm. Ringworm of the body usually appears as a flat, round patch anywhere on the skin. As the rash gradually expands, its center clears to produce a ring. More than one patch might appear, and the patches can overlap. The area is sometimes itchy.

Ringworm is widespread around the world and in Fiji. Ringworm is spread by either direct or indirect contact. People can get Ringworm by direct skin-to-skin contact with an infected person. People can also get Ringworm indirectly by contact with objects or surfaces that an infected person has touched, such as bed clothes and mats.

### **Cellulitis**

Cellulitis is a bacterial infection of the deepest layer of the skin. Bacteria usually enter the body through a break in the skin - from a cut, scratch, or from scabies. The bacteria that cause cellulitis are usually the staph or strep bacteria. Usually if the skin gets infected, it's just the top layer (impetigo). But with cellulitis, the deep skin tissues become infected and this is very serious as the cellulitis infection can spread very quickly. The infected area is red, hot, irritated and painful. Cellulitis is most common on the face and lower legs. In severe cases it can spread to the deeper layers of the skin and reach the muscle – in these cases the patients become very sick and will show danger signs.

## Abscess

A skin abscess is a collection of pus and infected material in the skin. The infection in an abscess is usually caused by the staph or strep bacteria. An abscess can develop from a cut, a scratch, or from scabies or impetigo. An abscess may also be called a boil, a furuncle (infection of a hair follicle), or a carbuncle (infection of a group of hair follicles). Skin abscesses may occur anywhere on the body. Abscesses develop a wall of fibrinous tissue around them and it can be difficult for antibiotics to penetrate this wall. Therefore abscesses often need to be incised and drained. Abscesses can be very painful as they push into the surrounding tissues. The infection in abscesses may spread locally or throughout the body. The spread of infection through the bloodstream may cause severe complications.

## Periorbital and orbital cellulitis

*Periorbital cellulitis* is a cellulitis infection in the skin around the eye. It can often develop from impetigo on the face. It may be associated with septicemia and can progress to cause orbital cellulitis.

*Orbital cellulitis* refers to infection in the tissues behind the eye. It is usually caused by spread of infection from the sinuses around the nose, but may be a complication of periorbital cellulitis. Children with orbital cellulitis may have restriction of eye movements, pain and proptosis (the appearance of the eye coming out of its socket). Orbital cellulitis is an extremely dangerous condition because it can very quickly lead to blindness – as such it is a medical emergency. It can also spread into the brain causing cavernous sinus thrombosis, meningitis or brain abscesses.

## Some other common skin conditions

*Measles*: The characteristic measles rash is classically described as a generalized, maculopapular and erythematous rash that usually appears several days after the fever starts.

*Napkin dermatitis (Nappy rash)*: Irritant napkin dermatitis is characterized as a patchy erythematous rash in the perineal areas in infants mainly seen on the convex surfaces with the skin folds spared. Secondary bacterial or fungal infection usually also involves the skin folds and there are often satellite lesions around the border.

*Varicella (Chickenpox)*: Chicken pox lesions begin as small (2-4mm) red papules with some surrounding erythema that become thin-walled vesicles filled with clear fluid. These vesicles become cloudy and then leaving a crust. Crops of new lesions may appear.

*Molluscum contagiosum*: Molluscum contagiosum lesions are flesh-colored, pearly dome-shaped papules. They are usually 1-5 millimeters in diameter and have a central dimple.

*Congenital skin markings*: There are a variety of congenital skin lesions, the most common being telangiectatic nevi (“Stork Bite” on the neck and “Angels Kiss on the forehead), as well as the Mongolian Blue Spot.

*Erythematous rashes associated with viral infections:* Numerous viral agents may cause erythematous rashes including Human Herpes Virus 6 and 7 (Roseola), and Parvovirus (Slapped Cheek).

*Tinea versicolor:* Tinea versicolor or pityriasis versicolor is a common skin infection caused by the yeast *Malassezia furfur*. Tinea versicolor is characterised by oval or irregularly-shaped pale spots of 0.5-4 cm in diameter, often merging together to form a larger patch.

*Urticaria (Hives):* Urticaria is characterised by raised red wheals that may appear anywhere on the body. The wheals may vary in size from 0.5cm to very large and are usually itchy. Urticaria is commonly caused by allergy.

*Papilloma virus (Warts):* There are a number of different forms of warts, but the most common is a raised wart with a roughened surface, usually seen on the hands and knees.

*Rashes associated with malnutrition including Kwashiorkor:* Children with Kwashiorkor have dry and depigmented skin that shows underlying oedema.

*Psoriasis:* There are a number of forms of psoriasis, but it commonly causes red scaly patches. The scaly patches can take on a silvery-white appearance. Plaques often occur at the elbows and knees.

### **Diagnosis: Assess the child and identify and skin condition**

Effective management requires careful attention to skin problems through history and examination. To determine if there is a skin problem ask the parent/care giver, AND assess the child by examination. Remember that some parent/care givers may trivialise skin conditions in their child and may not volunteer that their child has a skin problem, so it is important for the health care worker to check the child carefully.

1. To take a history, ask the parent/care giver specifically about skin problems.
2. Examine the child from head-to-toe.

Determine if this is an initial or follow-up visit for these problems. If this is a follow-up visit then manage the child as per the follow-up instructions (see “Give follow-up care” below.)

If it is an initial visit then follow the sequence of steps on the chart. The chart will help you to check for the appropriate signs for skin conditions.

### **Assess for a skin problem**

If the child has a skin problem, then ask the following questions:

ASK:

- Does the child have skin itchiness?
- Does the child have pain related to the skin problem?

Answers to both these questions provide important clues for correct classification of the skin condition.

To assess the child for skin conditions do the following:

| <b>LOOK AND FEEL</b>   |
|--|
| Look for extensive warm redness and swelling<br>Look for a localised warm, tender swelling or redness<br>Look for swelling or redness around the eyes<br>Look for discrete lesions with pus or crusts<br>Look for papules on the hands, knees, elbows, feet, trunk<br>Look for round to oval scaly patches |

To do this properly you need to examine the child all over the entire body. In older children the papules of scabies often appear on the hands and feet only, but in infants and in more severe cases in older children they may also appear on the trunk and nappy area. In all children look particularly in the web spaces of the fingers and toes for scabies papules. Skin sores occur most commonly on the lower limbs and also on the upper limbs in older children, but in infants they can occur all over the body. Abscess formation is also more common in children, particularly over the scalp.

### Classify the skin problem

Using the symptoms and the signs elicited using the system in Box 1 you can now classify the skin problem into one of several diagnostic categories which will then direct your management.

#### Box 1 Make a diagnosis of the skin problem

| <b>SIGNS</b>  | <b>CLASSIFY AS</b>                        |
|---|---|
| <ul style="list-style-type: none"> <li>Any general danger sign<sup>1</sup></li> <li>Extensive warm redness or swelling</li> </ul> | <b>VERY SEVERE SKIN INFECTION</b>         |
| <ul style="list-style-type: none"> <li>Swelling or redness around the eyes</li> </ul>   | <b>PERI-ORBITAL or ORBITAL CELLULITIS</b> |
| <ul style="list-style-type: none"> <li>Localised warm tender swelling and redness</li> </ul>                                      | <b>ABSCCESS or CELLULITIS</b>             |
| <ul style="list-style-type: none"> <li>Discrete sores/lesions with pus or crusts</li> </ul>                                       | <b>IMPETIGO</b>                           |
| <ul style="list-style-type: none"> <li>Itchiness AND</li> <li>Papules on the hands, knees, elbows, feet, trunk</li> </ul>         | <b>SCABIES</b>                            |
| <ul style="list-style-type: none"> <li>Round to oval flat scaly patches, may be itchy</li> </ul>                                  | <b>FUNGAL INFECTION</b>                   |
| If there are not enough signs to classify in any of the above boxes OR, other signs are present not found in the above boxes      | <b>OTHER SKIN CONDITIONS</b>              |

## Notes on the table:

1. General danger signs are signs used by IMCI practitioners identify children who need to be referred urgently to hospital. In IMCI we ask about general danger signs FIRST whenever a child is assessed. A general danger sign is present if:
  - The child is unable to drink or breastfeed
  - The child vomits everything
  - The child has had convulsions with this illness
  - The child is lethargic or unconscious
2. Use clinical expertise and other IMCI modules (for children aged less than 5 years) to recognise any general danger sign as children with skin diseases may be severely ill, either as a complication of their skin disease, or for another reason.
3. Extensive warm redness and swelling indicates a SEVERE SKIN INFECTION
4. Red swelling around the eyes indicates potential infection around the eye and is therefore a medical emergency because of the risk of loss of vision.
5. Sometimes it is difficult to distinguish an ABSCESS from CELLULITIS, but both are serious conditions
6. Many children with IMPETIGO have dry sores as well as sores with pus or crusts. In general only sores with ***pus or surrounding redness or multiple crusts*** require treatment.
7. In the case of SCABIES, there may only be 5 or less papules – it is important that these cases are recognised and treatment be initiated as scabies can rapidly progress. Look especially for these papules on the hands and feet, particularly in the web spaces of the fingers and toes.
8. It is our experience in Fiji that many health professionals do not consider SCABIES to be a clinical problem unless there is secondary bacterial infection – this is not always the case and SCABIES should be recognised if there are papules alone.
9. It is common for SCABIES infestation to be secondarily infected by bacterial infection – ***if the scabies lesions have crusts or pus then classify this as SCABIES and IMPETIGO – in this way you will be treating both for scabies and impetigo.***
10. Some children will have more than one skin problem and will be classified into more than one category – in fact this is quite common – for example:
  - a. FUNGAL INFECTION plus SCABIES, or
  - b. SCABIES plus IMPETIGO (***this may be the case if there are impetigo lesions that are separate to the scabies lesions, OR where there are cases of scabies with secondary bacterial impetigo infection***)

11. Not all causes of skin disease in children are outlined in this algorithm, and you may find that you think the child has a skin condition other than those in the main table – these include, but are not limited to:

1. Measles
2. Napkin dermatitis (Nappy rash)
3. Varicella (Chickenpox)
4. Molluscum contagiosum
5. Congenital skin markings
6. Erythematous rashes associated with viral infections
7. Tinea versicolor
8. Urticaria (Hives)
9. Papilloma virus (Warts)
10. Rashes associated with malnutrition including Kwashiorkor
11. Psoriasis

### Identify and treat the child with a skin problem

Based upon your classification of the skin condition you will then need to decide upon treatment. In some cases the child will need to be referred to hospital after a dose of an appropriate antibiotic – and in some of these cases it may be necessary for the child to be referred urgently.

### Determine if the child needs urgent referral

Using clinical skills and IMCI experience you should recognise the danger signs in children.

You will need to refer urgently if the child has danger signs that suggest:

- Any general danger signs
- Severe pneumonia, or very severe disease
- Severe dehydration
- Severe persistent diarrhoea
- Very severe febrile illness
- Severe complicated measles
- Mastoiditis
- Throat abscess
- Severe malnutrition or severe anaemia

Children with a skin infection can have a VERY SEVERE SKIN INFECTION – they may have general danger signs, the danger signs as for very severe febrile illness or they may have **extensive warm redness and swelling**. Children with a VERY SEVERE SKIN INFECTION needs urgent referral.

You should also urgently refer any child that has swelling or redness around the eye to suggest PERI-ORBITAL or ORBITAL CELLULITIS. This is because PERI-ORBITAL or ORBITAL CELLULITIS can lead to blindness if not treated promptly. This is an urgent problem.

### Identify and give early treatment and referral

Children with any general danger signs will need to have a dose of an appropriate antibiotic and be referred. See the other modules of the IMCI guidelines for information about this.

For children with evidence of VERY SEVERE SKIN INFECTION, or PERI-ORBITAL or ORBITAL CELLULITIS, give a dose of oral antibiotic as per the table in the algorithm, and then arrange for urgent referral. Doses of oral antibiotics will be discussed in more detail in the following sections.

### Identify treatment for the child that does not need urgent referral

Once you are able to exclude a need for urgent referral, you can then decide upon the appropriate treatment. Use the table to identify the appropriate treatment (Table 5).

### Classification and treatment of skin diseases (Urgent and non-urgent)

Table 5

| CLASSIFY AS                               | TREATMENT   |
|---|---|
| <b>VERY SEVERE SKIN INFECTION</b>         | 1. Give first dose of appropriate antibiotic<br>2. Refer URGENTLY to hospital   |
| <b>PERI-ORBITAL or ORBITAL CELLULITIS</b> | 3. Give first dose of appropriate antibiotic<br>4. Refer URGENTLY to hospital   |
| <b>ABSCESS or CELLULITIS</b>              | 1. Give first dose of appropriate antibiotic<br>2. Refer to hospital  |
| <b>IMPETIGO</b>                           | 3. Give an appropriate oral antibiotic for 7 days<br>4. Follow-up in 5 days   |
| <b>SCABIES</b>                            | 1. Give an appropriate topical skin cream<br>2. Treat the whole family with the cream<br>3. Follow up in 2 weeks  |
| <b>FUNGAL INFECTION</b>                   | 1. Give an appropriate topical antifungal for 2 weeks<br>2. Follow-up in 2 weeks  |
| <b>OTHER SKIN CONDITIONS</b>              | 1. If you are confident of the diagnosis (eg nappy rash) and you do not think that the child needs treatment arrange appropriate care<br>2. If you are not sure of the diagnosis or the management of the problem, refer to the doctor or skin clinic |

## Notes on Table 5 (above)

Three different treatments mentioned above:

- Oral antibiotic treatment
- Topical skin cream for scabies
- Topical skin cream for fungal infection.

Children with **VERY SEVERE SKIN INFECTION** need to be given their first dose of antibiotic and referred **urgently**.

Children with localised **CELLULITIS** need to have their oral antibiotic given and then need to be referred to the hospital for further care. Children with CELLULITIS often need to have intravenous antibiotic treatment.

Children with an **ABSCCESS** need to have their oral antibiotic given and then need to be referred to the hospital for further care. Children with an ABSCESS often need to have the abscess incised and drained and may need to have intravenous treatment following drainage. Some children with an ABSCESS can be managed with oral antibiotics followed by clinical review if the abscess is small – if there is any doubt, consult with the medical officer.

Some children with **IMPETIGO** (including cases where SCABIES has secondary IMPETIGO infection) will need to be referred to hospital for intravenous treatment if there are extensive lesions. If there is any doubt consult with the medical officer.

Some children will need a combination of treatments – you will find that it is very common to have to treat children for SCABIES and IMPETIGO.

Many children with IMPETIGO have dry sores as well as sores with pus or crusts. In general, only sores with ***pus or surrounding redness or multiple crusts*** require treatment with an oral antibiotic. More mild impetigo can be managed with simple skin hygiene methods.

## Types of treatment

### Antibiotic

The first line antibiotic treatment for children with CELLULITIS or ABSCESS, IMPETIGO is a single dose of Benzathine Penicillin G. Second line recommended treatment is oral Co-Trimoxazole.

***If there is a history of allergy to penicillins (that is, rash after having had a penicillin-type antibiotic)– use Co-Trimoxazole instead.***

### ***Treatment of cellulitis , abscess or impetigo***

- Evidence based treatment of skin disease/skin sores is a single dose of IM benzathine penicillin G (first line) or 5 days of oral Cotrimoxazole.
- First line antibiotic treatment: Benzathine Penicillin deep intramuscular injection.
- Second line antibiotic treatment: Co-Trimoxazole Syrup: Trimethoprim 4 mg/kg and sulphamethoxazole 20 mg/kg BD for 5 days



**Table 6:** IM doses: Benzathine penicillin G 2.4 mega units per vial. (Mix with 8mls water for injection to make 10mls.)

| Age in months.  | Weight in kg. | Dose in units. | Volume in mls |
|-----------------|---------------|----------------|---------------|
| 0 up to 3months | 2.5 – 5.9     | 300,000.       | 1.3           |
| 4 - 12          | 6 – 10        | 450,000.       | 1.9           |
| 13 - 36         | 11 – 14       | 600,000.       | 2.5           |
| 37 - 60         | 15 – 18       | 900,000.       | 3.8           |
| >60             | > 18          | 1,200,000.     | 5.0           |

If allergic to penicillin Co-Trimoxazole may be used as on page 25.

Many children with IMPETIGO have dry sores as well as sores with pus or crusts. In general only sores with ***pus or surrounding redness or multiple crusts*** require treatment. More mild impetigo can be managed with simple skin hygiene methods including soaking off of crusts and keeping the lesions clean by washing on daily basis.

### Topical cream for scabies

The first choice skin cream for scabies in Fiji is currently permethrin 5% as it requires only a single dose and is less irritant\* for small children than other scabies creams. The second choice cream is benzyl benzoate. Benzyl Benzoate can be used for older children to treat scabies (Table 7).

**Table 7 Treatment of scabies**

|  | FIRST CHOICE<br>Permethrin 5%   | SECOND CHOICE<br>Benzyl Benzoate 25%   |
|--|---|--|
| <b>2 months up to 2 years<br/>(4 – 10kg)</b> | Rub a thin layer all over the body once and leave overnight<br>Wash off the next day in full bath | Dilute† to 8.3% (dilute by 3)‡<br>Rub a thin layer all over the body once and leave overnight<br>Wash off the next day in full bath<br>Repeat for the next 2 nights  |
| <b>2 years up to 15 years</b>                | Rub a thin layer all over the body once and leave overnight<br>Wash off the next day in full bath | Dilute to 12.5% (dilute by 2) for children aged less than 5 years. Full strength for children 6-15 years.<br>Rub a thin layer all over the body once and leave overnight<br>Wash off the next day in full bath<br>Repeat for the next 2 nights |

\*If there are infected and open sores also present, then ointments and creams for scabies can be very painful – in this case, start oral antibiotic treatment for 48 hours and then start the ointment or cream for scabies.

†Dilute with water

‡For children under 2 months benzyl benzoate can be diluted by 4 to 6.25%

**Table 8 Topical cream for fungal infection**

|                                   | FIRST CHOICE<br>Whitfield's ointment                                    | SECOND CHOICE<br>Econazole cream  |
|-----------------------------------|---|---|
| 2 months up to 5 years (4 – 20kg) | Apply three times per day to the area where the ringworm is for 2 weeks | Apply three times per day to the area where the ringworm is for 2 weeks |

### **Counselling the parents/care givers**

Counselling the parent/care giver is an extremely important part of the treatment of skin conditions in children, particularly for the treatment of scabies.

Remember to use good communication skills:

- Ask and listen
- Praise
- Advise
- Check understanding

### **Treatment of impetigo**

It is important to explain to the parent/care giver what impetigo is. It is important to advise the parent/care giver the three points of treatment of impetigo:

1. Take the antibiotics for the full course.
2. Treat scabies if they are present
3. Keep the skin clean and clean open infected lesions with daily washes with soap and clean water.

The following is a more detailed guide on counselling the parent/care giver:

#### ***Explain what impetigo is***

- Impetigo is an infection by bacteria of the top layers of the skin.
- Skin sores are commonly caused by two bacteria – the “staph” and “strep” bacteria
- Impetigo starts as red or pimple-like sores surrounded by reddened skin. They fill with pus, then break open after a few days and form a crusted scab. Itching is common. many children will scratch their sores and this scratching can spread the lesions. Skin sores are spread by direct contact with sores or nasal mucus from an infected person.
- Dried strep and staph germs in the air are not infectious to skin with no breaks. The germs can enter broken skin, such as a scratch, cut or insect bite. In Fiji the most common cause of a break in the skin is when a person is infected with scabies. Scabies causes intense itching and scratching and this allows the germs from fingernails to enter the body and cause infection.

### ***Explain the treatment of impetigo***

There are three main parts of treatment for skin sores:

1. **ANTIBIOTICS:** Antibiotics are taken as tablets or syrup by mouth for 7 days.
2. **TREAT SCABIES:** If the child has scabies then he/she needs to start treatment for the scabies. You should also make sure that everyone in the house is also treated, because scabies can often be spread to other people who live together.
3. **KEEP THE SKIN CLEAN**
4. Keep skin sores clean with a salt water wash, or soap and clean water
5. Daily baths
6. Keep the house clean

### **Treatment of scabies**

It is very important to explain to the parent/care giver the following points:

1. Provide an explanation of what scabies is
2. Explain the 3 points of the treatment of scabies
  1. Treat with the cream all over the body
  2. Wash the clothes and bedding
  3. Treat other members of the family with the cream
3. Explain that scabies can be prevented from returning by bathing regularly and washing bedding and clothing regularly

The following is a more detailed guide on counselling the parent/care giver:

### ***Explain what scabies is:***

1. Scabies is a common skin condition caused by tiny itch mites.
2. They burrow under the skin and lay eggs which cause itching. The itch mites are very small and so are very hard to see. Scabies causes a red, itchy rash and grayish-white papules in between the fingers, on the elbows, hands, or wrists, under the armpits and other parts of the body. The itching may get worse at night.
3. Scabies spreads very easily between people. Scabies is spread by touching a person who has scabies. Sharing clothing, towels or a bed can also spread scabies. Scabies is easily spread between people in the one household. The scabies mite does not jump from one person to another and scabies does not come from animals.
4. Untreated scabies can become infected by bacteria and then are often called infected scabies.

### ***Explain the treatment of scabies***

1. Medication for the skin for the child
  1. Give the child a good wash first in hot (but not too hot) water and gently scrub the skin; then make sure the child is thoroughly dried off after the wash. Let the skin cool down before the next step.
  2. Apply the lotion - cover **every** inch of skin, between the fingers and toes, back, thighs...everywhere but not in the eyes, the mouth, the anus, the vagina or the tip of the penis. Any spot that isn't covered may have a live mite which will spread once the lotion is washed off. You will use only one lotion, but there are two options and the instructions for each are slightly different:

3. Once the time is up, wash off the lotion by giving your child a good wash in hot (but not too hot) water and gently scrub the skin; then make sure the child is thoroughly dried off after the wash (use a towel that has been washed).

**NOTE:** Itching may continue for 2-3 weeks, but this does not mean that the child is still infested. Clean the clothes, towels and bedding in the house. Clothing, towels and bedclothes used by the infested person in the 48 hours prior to treatment (some doctors say 5 days) should be washed using the hot water. This will kill the mites by drowning them in hot water. Alternatively, clothing, towels and bedclothes (and other items that might have the mite in them) can be put into a plastic bag and sealed off for one week because the mite cannot survive for very long periods off the human body.

### **Treat other people in the household with the cream**

Because scabies can spread so easily between people in the home it is really important to treat everyone in the home and clean all the clothes **ON THE SAME DAY**. This means:

1. Give the lotion to everyone
2. Wash all the clothes, towels and bedclothes

### **Treatment of skin fungal infections**

It is important to explain to the parent/care giver what skin fungal infections are. It is caused by tinea and is commonly called “ringworm” (even though it is NOT caused by a worm). It is important to advise the parent/care giver the cream or ointment needs to be applied 3 times per day for 2 weeks. The instructions for preventing ringworm are similar to those for scabies and impetigo – encourage regular washing of clothes, bed linen and towels and regular cleaning of the house, particularly mats.

### **Advise the parent/care giver when to return for follow-up of the skin problem**

In general all children with skin problems should be reviewed because skin problems can often be difficult to treat.

Advise parent/care giver to return immediately if the child that is sent home has any of these signs:

1. Unable to drink or breastfeed
2. Development of fever
3. Becomes more unwell

The parent/ care giver should be advised that if her child has **IMPETIGO** or **INFECTED SCABIES** then she needs to return with her child for a check-up at 5 days.

The parent/ care giver should be advised that if her child has **NON-INFECTED SCABIES** alone then she needs to return with her child for a check-up at 14 days.

The parent/ care giver should be advised that if her child has a **FUNGAL SKIN INFECTION** then she needs to return with her child for a check-up at 14 days.

**Photographs of common skin conditions covered in this guideline\*\***

Photo 1: Impetigo



Photo 2: Scabies



Photo 3: Scabies



Photo 4: Periorbital cellulitis



### Examples of other childhood skin conditions

Photo 5: Chickenpox



Photo 6: Molluscum contagiosum



Photo 7: Kwashiorkor





Photo 8: Tinea versicolor



Photo 9: Urticaria



\*\*All photos from Fiji IMCI skin guideline and used with permission of Paediatric CSN.



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