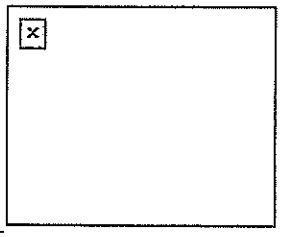
CELLULITIS AND SKIN ABSCESS (BOIL)

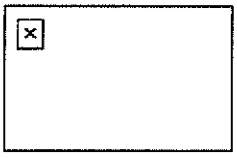


Cellulitis is an acute spreading infection of the skin and subcutaneous (beneath the skii tissue affecting any area of the body.

Abscess of the skin is a soft tissue infection where pus has collected and is surrounde inflamed tissue. Abscesses may occur as a result of cellulitis.

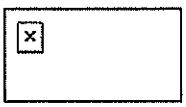
Symptoms	Cellulitis	Abscess
Pain	Yes	Yes.
Redness	Yes	Sometimes.
Swelling	Yes	Yes.
Warmth	Yes	Sometimes.
Firm to touch	Yes	No.
Ooze	Sometimes	Sometimes.
Fever	Sometimes	Sometimes.
Swollen glands	Sometimes	Sometimes.

HOW YOUR CHILD CONTRACTED THIS INFECTION.



Cellulitis often begins in an area of broken skin like a cut or scratch. It may also start in areas of intact skin, especially in people who have diabetes/poor health, low iron, or an immune system deficiency. Cellulitis is caused by many different bacteria (bugs). Recurrent boils may come from infection being passed from one family member to another and treating everyone in the family at the same time may be necessary.

TREATMENT.



Antibiotics will usually be given for 7 to 10 days. Improvement should be noticed in 1 to 2 days. For severe infections, or if there is no improvement with oral antibiotics, intravenous antibiotics and/or surgery may be necessary. This will usually be followed by a course of oral antibiotics. It is important to take the medicine at regular intervals until it is finished.

Resting and elevating the affected area is also beneficial.
Paracetamol can be given as prescribed for pain and fever.
If the area is discharging you will need to keep the area covered and the paediatric community nurse may visit you at home to change the dressing.

WHAT IS NOT OK 

Increasing pain, redness, or swelling.
A thin red line heading toward the heart (spreading infection).
A painful joint.
On going vomiting (can be antibiotic related).
Continuing fever.
No improvement after 24 hours of treatment.
See a doctor if any of the above is happening.

WHAT IS OK 

To have redness and swelling for a few days after starting antibiotic treatment.
To have a hard lump surrounding the area for some time following treatment.
To have contact with friends and family, however it is important to wash hands well and keep any oozing wounds covered.

PREVENTION 

- If your child gets a scrape, wash the wound well with running water and soap. Cover with a plaster and keep an eye out for any signs of infection.
- To keep clean, use a clean rag and a cup of warm water with ½ a teaspoon of salt. Use the rag to soak the wound or sore and throw rag into rubbish. Dry with clean rag and throw rag into rubbish.
- If your child has eczema keep the skin well moisturized and the eczema as under control as possible.
- See a GP early if redness or swelling develops around a cut or graze or if the wound is large, deep or from a bite (animal or human).
- Try to protect your child's skin from injury by using appropriate protective clothing and equipment when playing sports or participating in at risk activities.
- It is necessary for the infected person to have their own towel which should be washed daily.
- The shower/bath must also be cleaned after use by this person.

Written by Bronwyn.Fargher & Sally Lane, Children's Health Service HVDHB 2004

ECZEMA

Introduction

Eczema (also called atopic dermatitis) is characterised by dry itchy skin with areas of poorly demarcated erythema and scale. In the acute phase eczema may be vesicular and oozing, in the chronic phase it may become hyperpigmented and lichenified (thickened). Excoriations (scratch marks) are frequently seen.

Onset is usually after 3 months of age. In infancy, there is involvement of the face, scalp and extensor surfaces. In childhood, the flexures of the knees and elbows, and extensor surfaces of wrists and ankles are often involved.

Flares of eczema can be either localised (with intensely inflamed, weeping and infected skin), or generalised (called erythroderma when >90% of body surface is involved). Flares are almost always associated with infection, especially by Staphylococcus aureus.

Differential diagnoses

The following conditions should be considered:

- Seborrhoeic dermatitis – onset <3 months, not itchy, greasy scale on scalp, flexures and nappy area
- Contact dermatitis – to products such as sticking plasters, nickel, fragrances, hair dye
- Irritant dermatitis – especially with frequent handwashing
- Plant contact dermatitis – acute indurated vesicular weeping dermatitis in areas of contact with the specific plant e.g. Rhus tree
- Impetigo – Staphylococcal (or Streptococcal) skin infection. Highly contagious.
- Tinea capitis and corporis – fungal infection (tinea capitis) should be considered in scalp inflammation, particularly between 3 and 10 years of age. Tinea corporis typically causes annular plaques, but the appearance can be modified if corticosteroids have been applied. Diagnosis requires skin scrapings +/- hair to be taken for microscopy and culture. Topical corticosteroids should not be used.

Eczema-like eruptions in the newborn period can be the presenting feature of a number of rare and severe conditions (e.g. immunodeficiency, ichthyosis, Langerhans cell histiocytosis) and referral to a dermatologist should be considered.

ECZEMA

Indications for Admission to Hospital

The usual indications for admission to hospital include

- Control of infection
- Intensification of topical therapy
- Controlling the itch/scratch cycle

Usually all three are involved.

Treatment in hospital

Treatment of infection

Antibiotics
All children with flares of eczema requiring admission should be treated with antibiotics. It is preferable to give these orally unless there is severe infection or systemic illness. Treatment should be for 7-14days
Antibiotic choices include:

- Flucloxacillin IV 100mg/kg/day in 4 doses (max 1000mg/dose)
- PO 100mg/kg/day in 4 doses (max 500mg/dose)
- Cephalexin PO 50-75mg/kg/day in 3 doses if flucloxacillin not tolerated
- Erythromycin PO 40mg/kg/day in 4 doses (max 500mg/dose) if flucloxacillin not tolerated or penicillin-allergic
- Co-trimoxazole PO if flucloxacillin not tolerated

Skin swabs should be taken at admission.

Antivirals
Eczema herpeticum is caused by the herpes simplex virus. It causes multiple vesicles or punched-out erosions which may become confluent.

- Aciclovir IV 250mg/square metre/dose 8 hourly (max 500mg/dose) for 5 days. For infants <3/12 discuss with Infectious Disease service.

Ophthalmology referral should be made for all lesions near the eye.
Viral swabs should be taken before commencing treatment.

Treatment with topical steroid is contraindicated in the region of herpes infection.
Wet wraps are contraindicated in eczema herpeticum.

If there is significant infection and crusting it may be necessary to delay wet wraps for the first 24 hours while the infection is brought under control using antibiotics and potassium permanganate baths.

ECZEMA

Baths

Baths serve the purpose of removing dead skin, crusts and old creams, and prepare the skin for application of new treatments.

- Potassium permanganate – astringent (drying) and antiseptic. Very useful for weeping, crusted and infected skin. Dissolved potassium permanganate crystals/tablets/solution should be added to the bath water so that the water becomes a rose-pink colour. It will stain finger and toe nails and the bath brown.
- Oily baths – moisturise the skin. These can be introduced once the weeping has settled (usually after 2 - 3 days). Examples Alpha Keri bath oil, Dermaveen bath solution, QV, Oilatum. Do not use fragranced products.

Aqueous cream or emulsifying ointment may be used as soap substitutes.

Wet wraps

These are useful for inpatient management of widespread eczema. Maximum benefit is achieved during the first week of treatment, and ongoing use more than 2 weeks has not been shown to provide benefit over creams alone. Limited trial data does not show benefit in outpatient settings compared with correct use of creams alone.
Wet wraps work by:

- keeping the skin hydrated
- promoting absorption of creams by occlusion
- cooling the skin by evaporation
- acting as a barrier to reduce damage from scratching

Advantages of wet wraps include rapid response to therapy, reduction in itch and sleep disturbance, and potential for reduction in usage of topical corticosteroids.

Disadvantages include high cost for families of outpatient use, the necessity for special training in usage, potential for increased corticosteroid absorption, increased cutaneous infections and folliculitis, and poor tolerance by some children.

Wet wraps with corticosteroids will result in systemic absorption. It is recommended that in children mild corticosteroids or dilute preparations of more potent corticosteroids are used for short periods only. Outpatient use requires close supervision.

ECZEMA

Wet wraps with tubular bandages or garments
These are usually applied and left on for 12 hours. For inpatients they should be applied twice a day.

Application Method:

- Prepare lengths of Tubigrip tubular bandages, two lengths for each arm and leg and two lengths for the vest
- One length of each is soaked in warm water
- Bath and wash child as above
- Apply the prescribed moisturiser/steroid to front and back of body liberally
    - Infants <1 year use 1% hydrocortisone (use at least 15-20g per total body application with generous emollient on top)
    - Children >1 year use 10% beta in cetomacrogol (use approx 200g per application, this contains emollient already). This needs to be ordered and mixed by the hospital pharmacy.
    - The creams must be applied generously so that the child is covered with a thick layer before the wrap is applied
- Put on the moist vest first and then the dry one on top
- Do the same for the arms and legs
- Secure lengths of Tubifast on arms and legs to the vest, by using a small piece as a tie
- If the under layer dries out the cooling evaporative effect is lost and the child will become uncomfortable. If this occurs, the top layer of bandaging should be taken down and the under layer made wet again using a wet flannel or a water spray.

With properly applied twice daily wet wraps most children will become clear of eczema in less than 5 days. Ideally the child should be nearly clear of eczema and have 24hours of treatment without wraps on their discharge regimen before they go home

30 minute wraps – for older children / adolescents
These are often better tolerated then wet wraps in older age groups.
You can wrap the entire body, or just troublesome areas e.g. the lower legs.

Equipment:
A bath (shower only if a bath is not available)
Bath oil or potassium permanganate
Clean old towels or "cuddly"
Hot water
Large waterproof sheet (e.g. rubber or plastic sheeting, mattress protector, plastic table cloth)
Beta cream
Moisturiser

Instructions:

1. Place the waterproof sheet down on the bed.
2. Bath with potassium permanganate or bath oil for about 15 minutes.
3. Get out of the bath, pat dry and apply beta cream generously to all the areas affected by eczema. Don't be sparing, expect to use 50g (10y) to 100g (adult size) per total body application. If there are large areas without eczema just apply moisturiser to these.
4. Wet the towels with hot water in a bucket or sink.

5. Wring the towels out so they are damp. When the towels are cool enough to apply to the skin (but still hot) place the damp towels down on the waterproof sheet and lie on top of them. Wrap the towels around the body. Legs can be held together with one towel around them both, or wrapped separately. Arms can be held against the body, or wrapped separately.
6. Then wrap the waterproof sheet around the towels. Initially this will make it quite hot and steamy in the wrap. Place a blanket over the top.
7. Leave the wrap in place until the towels have cooled down (usually 15-20 minutes).
8. Remove the wrap and apply generous moisturiser to the entire body.

This should be repeated twice daily until eczema has cleared (usually 3-5days).

After inpatient treatment with wet wraps, parents should be encouraged to be proactive with use of topical corticosteroids to try to maintain the skin free from eczema and prevent rebound. Follow up should be arranged in the next few weeks to review topical management.

Facial eczema

Use compresses of potassium permanganate to reduce weeping.
1% hydrocortisone twice daily is standard treatment for most children. In severe cases eumovate may be used, but not on eyelids and for a maximum of 10 days.

Emollients

These may be applied to any exposed areas of skin as often as possible during the day. For inpatients use a greasy preparation such as duoleum (50:50 liquid:white soft paraffin), emulsifying ointment, fatty cream, or the patients preferred emollient as long as this is fragrance-free.

Antihistamines

Antihistamines may be helpful in reducing itch and aiding sleep. Usually requires a sedative dose.

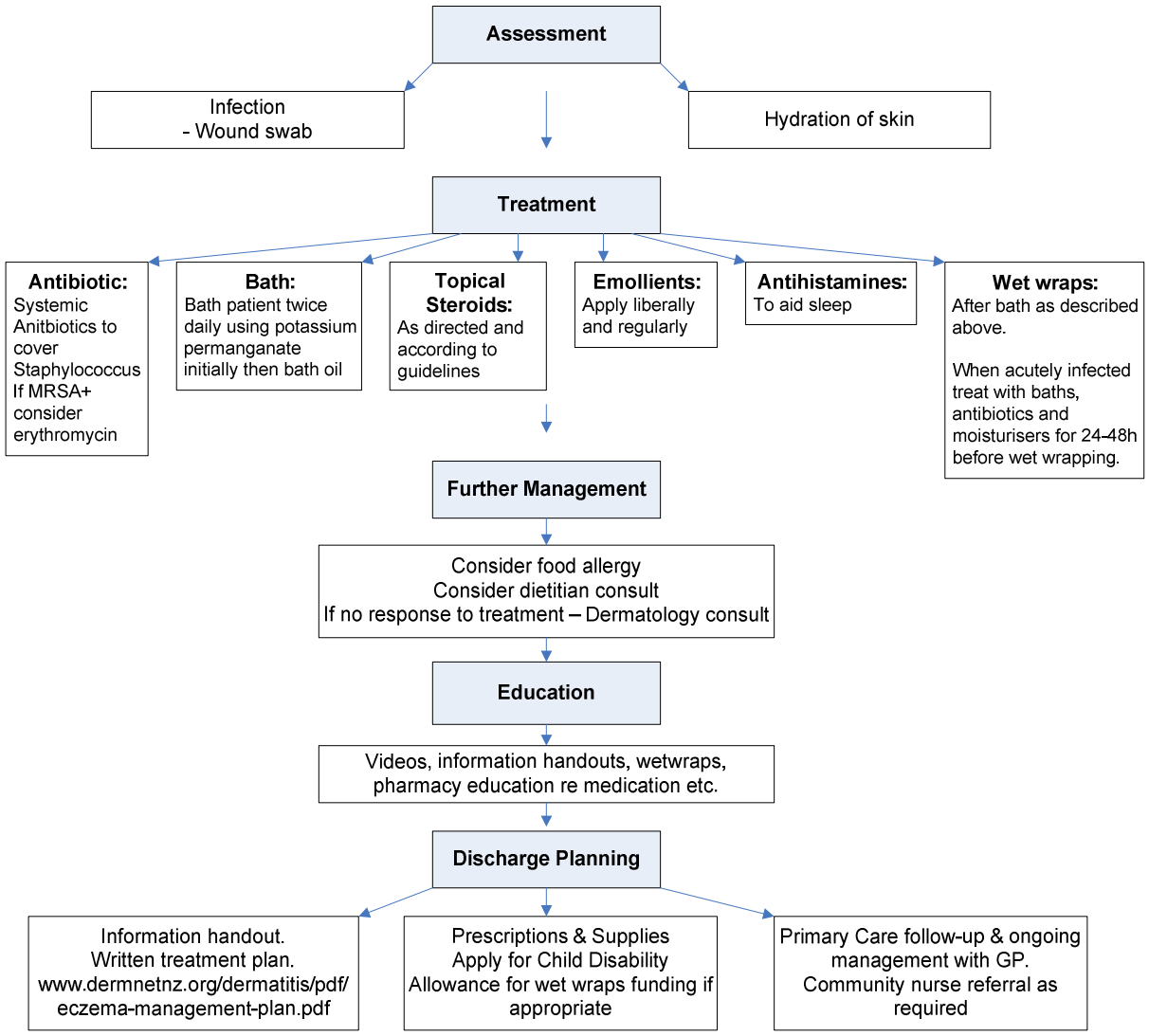
- Promethazine 0.5mg/kg/dose at night (max 50mg) and 0.25mg/kg/dose mane
- Vallergan forte 1 – 2 mg/kg at night

Paediatric Dermatology Referral

This should be considered for cases refractory to standard treatment, requiring repeated hospital admission, with significant psychosocial impact (e.g. missing school, bullying) or where systemic treatments need to be considered.

ECZEMA

Inpatient Management Flow Chart



ECZEMA

Outpatient management of eczema

Baths

When eczema is active, children should ideally be given a bath containing bath oil twice daily. The frequency of baths can be reduced as eczema improves.
Soap should be avoided. Aqueous cream or emulsifying ointment or other non-subsidised soap-free washes (e.g. Cetaphil, Dermsoft, QV wash) can be used as a soap substitute. Bathing should last no more than 20 minutes to ensure adequate skin hydration but not long enough to cause wrinkling. The skin should be pat dried.
Corticosteroids (if needed) should be applied immediately after the bath to maximise absorption and emollients afterward (ideally at least half an hour later if this is practical).

Infection

If the eczema becomes weepy with pus, it is probably infected with Staphylococcus aureus and systemic antibiotics should be used (as described in Inpatient section above).

Antiseptic baths two to three times per week to reduce staphylococcal skin colonisation can aid with overall eczema control and reduce infective flares.

- Add bleach (Janola) to the bath water at a concentration of 1/1000 (half a cup of 3-5% bleach to 15cm deep full-sized bath)
- Alternatively use antiseptic bath oils Oilatum Plus or QV flare up (these are not subsidised)

Varicella vaccination should be considered.

Emollients

Emollients are essential and frequently underused. They should be applied liberally and as often as is required to keep the skin well-hydrated to help maintain its barrier function, even when the eczema is well-controlled.

- Ointments (e.g. emulsifying ointment, duoleum) are greasier and more effective.
- Creams (e.g. aqueous and cetomacrogol) are less greasy but may be cosmetically more acceptable.
- Oily creams (e.g. healthE fatty cream, lipobase) are midway between creams and ointments in effectiveness and are usually cosmetically acceptable.
- Lotions are lighter still and generally not effective in eczema.

Ensure adequate quantities are prescribed (at least 500g per fortnight).

Topical steroids

In general:

- Lowest strength required to clear eczema should be used
- Steroids should be used to affected areas in adequate amounts (*not* sparingly)
- Steroids should be applied no more than twice a day
- Steroids should not be used continuously for weeks/months without adequate supervision
- If applied under occlusion steroids have significantly increased absorption

ECZEMA

The potency of steroids:

	RELATIVE POTENCY	
• 1% Hydrocortisone	1	Mild
• Eumovate	25	Moderate
• Advantan	100	Potent
•		
• Locoid® (Hydrocortisone butyrate 0.1%)	100	Potent
• Beta® (Betamethasone valerate 0.1%)	100	Potent
• Elocon® (Mometasone furoate 0.1%)	175	Potent
• Dermol® (Clobetasol proprionate 0.05%)	600	Very Potent

Always check whether the cream or ointment you are prescribing is fully funded by Pharmac (can be checked via the Pharmac website). http://www.pharmac.govt.nz/Schedule

In general 1% hydrocortisone is sufficient for facial eczema and for eczema on infants under 1year.

For school age children, eczema on the body (excluding face, neck, groin) *usually* requires a potent steroid.

Dermol is rarely needed for childhood eczema and should only be used with caution.

Steroid side effects on the skin are rarely seen in children. They are more likely to be seen with use of very potent preparations, use under occlusion (including in the flexures) or with continuous use for months at a time (even of mild preparations).

Use of a stronger preparation for short bursts is generally preferable to ongoing use of a milder preparation.

Ensure that sufficient quantities of steroid cream are prescribed. For example:

Weight of cream required for twice daily application of steroid cream to the entire body:

Requirement for topical steroids	6 months old	12 months old	5 years old	12 years old
Daily (g)	9.5g	12g	20g	36.5g
Weekly (g)	67g	84g	140g	255g

A practical guide to topical therapy in children. Long et al. Br J of Dermatol 1998;138:293-296

ECZEMA

Avoidance of irritants/allergens

This includes soap or bubbles in the bath, perfumes or grass. Nails should be cut short and cotton clothes should be worn. Reduction of house dust mite exposure can be achieved by encasing mattress, base and pillows in special covers and by hot water (>55°C) washing of top bedding each fortnight.

Diet

Food *may* be one of many triggers for eczema in children. Food allergy being a factor is more likely in young infants with severe generalised eczema. Evaluation of food allergy in children with eczema is fraught as these children are usually atopic, and allergy tests can reflect sensitisation rather than clinically relevant allergy. RAST testing will give many false positive results – consider immunology referral to assist with management.

Investigation of possible food allergy is recommended:
- If there is a history of an immediate food allergic reaction (this can occur via maternal ingestion in a breast fed baby)
- In young children with severe problematic eczema not responsive to adequate topical treatment

Food exclusion diets for eczema have the risk of loss of tolerance (i.e. developing anaphylactic reaction on future exposure) and failure to thrive, as well as being expensive and complicated for families. They should be initiated as a trial and continued only when of clear benefit. If more than two major food groups are excluded dietitian involvement is advised.

Other Treatments

- Oral Steroids are associated with rebound and although they can be useful in some circumstances, should be used with caution. If oral corticosteroids are used, they need to be replaced with another systemic agent or weaned slowly, usually over months.
- UV therapy, cyclosporine, methotrexate and azathioprine require referral to a dermatologist
- Pimecrolimus - Not funded in NZ but is effective in mild to moderate facial eczema and is available as Elidel. Need to discuss side effects and contraindications.
- Long term antibiotics may be helpful in some cases with recurrent infection, but have the risk of inducing bacterial resistance.

Paediatric Dermatology Referral

This should be considered for cases refractory to standard treatment, requiring repeated hospital admission, with significant psychosocial impact (e.g. missing school, bullying) or where systemic treatments need to be considered.

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What is impetigo?

Impetigo is a bacterial skin infection. It is often called school sores because it most often affects children. It is quite contagious.

What is the cause of impetigo?

Streptococcus pyogenes and/or *Staphylococcus aureus* are the micro-organisms responsible for impetigo.

Impetigo may be caught from someone else with impetigo or boils, or appear out of the blue. It often starts at the site of a minor skin injury such as a graze, an insect bite, or scratched eczema.

Treatment

Treatment depends on the extent and severity of the infection.

- **Soak moist or crusted areas**
  Soak a clean cloth in a mixture of half a cup of white vinegar in a litre of tepid water. Apply the compress to moist areas for about ten minutes several times a day. Gently wipe off the crusts.
- **Antiseptic or antibiotic ointment**
  If an antiseptic (povidone iodine, hydrogen peroxide cream, chlorhexidine and others) or antibiotic ointment (fusidic acid, mupirocin or retapamulin) is prescribed, apply it two or three times a day to the affected areas and surrounding skin. Look carefully for new lesions to treat. Continue for several days after healing.
- **Oral antibiotics**
  Oral antibiotics are recommended if the infection is extensive, proving slow to respond to topical antibiotics, or if the impetigo is recurrent. The preferred antibiotic is the penicillin antibiotic, flucloxacillin. The complete course should be taken, usually at least 7 days.
- **Treat carrier sites**
  If impetigo is proving hard to get rid of, the following measures may be useful:
  - Apply an antibiotic ointment to the nostrils three times daily for 7 days.
  - Wash daily with normal soap, antibacterial soap or cleanser.
  - Take a prolonged course of oral antibiotics.
  - Identify and treat the source of re-infection i.e. another infected person or carrier.

  The nostrils of a household contact may be a carrier site for pathogenic bacteria, without that person having any sign of infection.
- **General measures**
  During the infectious stage, i.e. while the impetigo is oozing or crusted:
  - Cover the affected areas.
  - Avoid close contact with others.
  - Affected children must stay away from school until crusts have dried out.
  - Use separate towels and flannels.
  - Change and launder clothes and linen daily.

What is Scabies?

Scabies is an itchy rash caused by a little mite that burrows in the skin surface. The human scabies mite's scientific name is *Sarcoptes scabiei* var. *hominis*.

How does one get scabies?

Scabies is nearly always acquired by skin-to-skin contact with someone else with scabies. The contact may be quite brief such as holding hands. Frequently it is acquired from children, and sometimes it is sexually transmitted. Occasionally scabies is acquired via bedding or furnishings, as the mite can survive for a few days off its human host.

Scabies is not due to poor hygiene. Nor is it due to animal mites, which do not infest humans. However animal mites can be responsible for bites on exposed sites, usually the forearms.

Typically, an affected host is infested by about 10 -12 adult mites. After mating, the male dies. The female scabies mite burrows into the outside layers of the skin where she lays up to 3 eggs each day for her lifetime of one to two months. The development from egg to adult scabies mite requires 10 to 14 days.

Treatment

Scabicides are chemical insecticides used to treat scabies. Those available in New Zealand include:

- 25% Benzyl benzoate lotion, applied daily for 3 days
- 5% Permethrin cream, left on for 8-10 hours
- 0.5% Aqueous malathion lotion, left on for 24 hours

Gamma benzene hexachloride cream is no longer recommended because of resistance and potential toxicity. Sulphur and crotamiton were popular in the past but are relatively weak scabicides.

The scabicide has to be applied before bed to the whole body from the chin to soles. The scalp and face also need to be treated in children under 2 years, those confined to bed, and some others with reduced resistance.
A repeat treatment a week later is often recommended. It should not be repeated for several weeks after that without medical advice. Overuse of insecticides will irritate the skin.

Each treatment with scabicide should be followed the next morning by hot-wash laundering or dry cleaning of sheets and pillow cases and any clothes worn against the skin over the last week. Non washable items should be sealed in a plastic bag and stored above 20° C for one week. Alternatively they can be frozen below -20° C for 12 hours. Rooms should be thoroughly cleaned with normal household products. Fumigation or specialised cleaning is not required. Carpeted floors and upholstered furniture should be vacuumed and all areas cleaned with normal household products. The vacuum bag should then be discarded and furniture covered by plastic or a sheet during treatment and for 7 days after.
Most people's itch improves within a few days of treatment but it may take 4-6 weeks for the itch and rash of scabies to clear completely because of dead mites at the skin surface. These will be slowly cast off.

To reduce the risk of the treatment failing:

- Ensure the scabicide is applied to the whole body from the chin down.
- Leave it on for the recommended time and reapply it after washing.
- Apply the scabicide under fingernails using a soft brush.
- Obtain antibiotics from your doctor if there is crusting and secondary infection.
- Ensure all close contacts are treated whether or not they are itchy.

Persistent rash

Occasionally a rash persists even though every mite has been killed. Reasons for this include:

- Scabies nodules may take several months to settle down. They are not infectious. A topical steroid may help; apply it accurately to each bump.
- The scabies can result in dermatitis. Dermatitis can be due to the mite, the scratching, the treatment or other factors. Persistently itchy patches should be treated with frequent applications of emollients and mild topical steroids.
- The diagnosis may be incorrect. Scabies can be confused with a number of other skin conditions, particularly dermatitis and papular urticaria. If you have an itchy rash, your doctor may treat you for scabies 'just in case', even when it is more likely you have another skin disorder. This is because it is important to treat scabies vigorously to prevent other people catching it.
- Resistance to treatment. Scabies occasionally appears to be resistant to the prescribed scabicide. Obtain advice from your doctor; a different scabicide or other treatment may be prescribed. You may be referred to a dermatologist.

Oral ivermectin has proved very effective and is now considered treatment of choice for crusted scabies and other resistant cases.