Introduction
Athlete’s foot, also called tinea pedis, is a contagious fungal infection which affects the skin on the feet, and can spread to the toenails and sometimes the hands. Many people suffer from athlete’s foot and the condition usually responds well to over-the-counter (OTC) treatment.

Causes
Athlete’s foot occurs when the tinea fungus grows on the feet. The fungus thrives in warm, moist environments, and the spaces between the toes can provide a good environment for the fungus to grow. The fungus is transmitted through direct contact with an infected person, or by touching surfaces contaminated with the fungus. It is commonly found in showers, on locker-room floors, and around swimming pools.

Risk factors
The following factors can increase one’s risk of getting athlete’s foot:
• Walking barefoot when visiting public places such as locker rooms, showers, and swimming pools
• Sharing socks, shoes, or towels with an infected person
• Wearing tight-fitting shoes with closed toes
• Having wet feet for long periods of time
• Having sweaty feet

Symptoms
Athlete’s foot is usually a mild infection, which presents as itchy, flaky skin in the web spaces between the toes. The flakes or scales of skin become white and macerated, and begin to peel off.

Underneath the flakes, the skin is usually reddened and may be itchy and sore. The skin may be dry and scaly, or moist and weeping. Sometimes the skin between the toes becomes cracked and sore, and splits open which may be very painful.

Source: https://www.medicinenet.com/athletes_foot/article.htm
The web space between the fourth and fifth toes is most commonly affected.

In more severe cases of athlete’s foot, there may be signs of bacterial infection such as weeping, pus or yellow crusts. The infection may also spread to the soles of the feet.

The toenails may appear to be discoloured, thick and crumbly, or they may pull away from the nail bed. If these symptoms occur, referral to a doctor is required.

**“Wear footwear such as rubber sandals in public showers, around public swimming pools, and in changing rooms in other public places”**

**Prevention**

The following measures can help to prevent athlete’s foot infections:

- Wash the feet daily with soap and water and dry them thoroughly, especially between the toes.
- Use an antifungal powder on the feet every day.
- Keep shoes and socks free of fungus. Socks should be washed and changed regularly, and shoes can be dusted with an antifungal powder to eradicate the fungus.
- Do not share socks, shoes, or towels with others.
- Wear footwear such as rubber sandals in public showers, around public swimming pools, and in changing rooms in other public places.
- Sweating of the feet can result in a hot moist environment which enables the fungus to grow. Wearing leather shoes, rather than shoes made of synthetic materials, will allow the skin to breathe.
- Socks should be made out of breathable fibres, such as cotton, and changed every day.
- Wear open-toed sandals in summer, and allow your feet to air by going barefoot when convenient.

**Treatment**

Athlete’s foot may be effectively treated with topical antifungal agents which are available OTC.

Formulations include creams, ointments, solutions, lotions, sprays and powders.

Creams are often used, but all formulations are effective.

Antifungal powders are effective as monotherapy, and in addition may sometimes be useful when used in conjunction with a cream or solution to treat moist areas.

The patient should be instructed on the correct usage of the recommended treatment, and the pharmacist’s assistant is well placed to advise in this regard.

The treatment should always be applied to feet which have been washed and thoroughly dried, especially between the toes.

The preparation should be applied for as long as is advised. Since this varies between the different products, the instructions of the manufacturer should be carefully read.

In order to prevent recurrence of the infection, treatment needs to be continued until after the symptoms have disappeared. Two to four weeks treatment is usually needed.

A doctor should be consulted if there has been no improvement in the condition after two weeks.

**Mild infections of athlete’s foot may respond well to:**

*Compound undecenoate preparations*

The zinc contained in these formulations helps to reduce rawness and irritation of the skin. These agents are available as ointments, creams and powders.

The cream contains zinc undecenoate 20% and undecenoic acid 5%, and should be applied daily.

The powder contains zinc undecenoate 20% and undecenoic acid 2% and should be applied twice a day.

Treatment with these agents should be continued for four weeks.

*Compound benzoic acid ointment (Whitfield’s ointment)*

This ointment may be effective as an antifungal agent and is less expensive, but it can be less acceptable cosmetically than some of the other preparations. It contains benzoic acid and salicylic acid, and may be applied twice a day, and treatment continued for four weeks. Salicylic acid may cause mild irritation to the skin.

*Tolnaftate*

Tolnaftate is available as a 1% cream formulation, and may be applied twice daily for two to three weeks. In some cases treatment may have to be continued for up to six weeks. This agent may sting slightly when applied to infected skin.

Compound undecenoate preparations, compound benzoic acid ointment, and tolnaftate are suitable for adults and children.
SKIN CARE

Moderate infections of athlete’s foot may usually be successfully treated with a topical imidazole derivative, or an allylamine such as terbinafine.

Topical imidazole derivatives exert both antifungal and antibacterial activity. This is useful as secondary infection can occur. Treatment is usually continued for 14 days after the lesion has healed. Occasional burning and irritation of the skin may occur. These products are contra-indicated if there has been previous sensitivity to any of these agents. Systemic absorption is minimal if these agents are applied to intact skin.

The following are examples of topical imidazoles:

**Clotrimazole.** This is available as a 1% cream, and should be applied thinly two to three times per day for two to four weeks. It is suitable for adults and children.

**Econazole 1%** is available in cream, powder or spray solution formulations.

Econazole cream may be applied up to three times a day for two to four weeks. Econazole spray and powder should be used twice a day for two to four weeks. The powder can be used as a support measure in conjunction with the cream or solution, or dusted into socks as a prophylactic measure. Econazole may be used by adults and children.

**Miconazole 2%** cream may be applied twice a day for two to four weeks, and treatment should be continued for fourteen days after symptoms have disappeared. It may be used by adults and children.

Caution should be exercised when considering the use of clotrimazole, econazole, and miconazole topical preparations for the treatment of athlete’s foot in pregnant or lactating women.

**Ketoconazole 2%** cream may be applied twice daily until some days after the symptoms have disappeared. This may take four to six weeks. The diagnosis should be reviewed if there is no improvement in the condition after four weeks. This agent may be used by adults. Pregnant women would best be referred to a doctor if ketoconazole is being considered for the treatment of athlete’s foot in pregnant or lactating women.

**Terbinafine** is an example of an allylamine. It is available in 1% cream, emulsion gel, spray, and film-forming solution formulations. Terbinafine cream is applied once or twice a day until the infection clears, usually one to two weeks. The emulsion gel and spray formulations may be applied once daily for a week. Terbinafine cream, emulsion gel, and spray formulations are registered in South Africa for adults and children over twelve years of age.

Terbinafine film-forming solution is indicated for mild to moderately severe tinea pedis infections. Hands and feet should be washed and dried before using this solution, which is applied as a single administration to both feet, even if symptoms are visible on one foot only. The treatment should be applied in a thin, even layer between and around the toes, the soles, and 1.5 cm up the sides of the foot. It should not be massaged into the skin. The solution should be allowed to dry for one to two minutes, and will form a film. The feet should not be washed for twenty four hours after application of this treatment.

In South Africa, terbinafine solution is registered for adults and adolescents over 15 years of age.

There is evidence that terbinafine is more effective than the imidazoles in preventing recurrence, and therefore may be useful in cases where athlete’s foot tends to recur frequently. Terbinafine can cause redness, itching, and stinging of the skin. Contact with the eyes should be avoided. Pregnant women would best be referred to a doctor if topical treatment for athlete’s foot with terbinafine is being envisaged.

**Remember**

When treating athlete’s foot, it is important to apply all topical antifungal products in accordance with the instructions of the manufacturer.

Treatment needs to be continued after the symptoms have disappeared to prevent recurrence of the condition.

Contra-indications, including pregnancy, lactation, and suitability for children, should be borne in mind.

**Refer to the doctor if:**

- The athlete’s foot is severe, and other parts of the foot are affected
- There are signs of bacterial infection
- There has been no response to appropriate treatment
- The patient is a diabetic
- The toenails are involved

**Conclusion**

Athlete’s foot is usually a mild fungal infection which responds well to OTC topical antifungal treatment. Observing preventative measures may reduce the incidence of recurrence of the condition. Sometimes the fungal infection can be difficult to eliminate. If the condition does not respond after appropriate treatment, a doctor should be consulted.

**Bibliography**


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