Fungal Scalp Infection (Scalp Ringworm)

Ringworm is a skin infection caused by a fungus (not a worm). Ringworm on the scalp mainly affects children, particularly children of African or Caribbean origin. Treatment is with antifungal medication which you need to take for several weeks. An antifungal shampoo is not effective alone but may be advised in addition to medication.

What is ringworm?

Ringworm is a fungal skin infection. (It is not due to a worm as its name implies!) There are many types of fungal germs (fungi) and some can infect the skin, nails and hair. This leaflet just deals with scalp ringworm which is sometimes called tinea capitis (from the Latin word caput, meaning head).

For information on other fungal infections, see the separate leaflets called Ringworm (Tinea Corporis), Athlete's Foot (Tinea Pedis), Fungal Groin Infection (Tinea Cruris) and Fungal Nail Infections (Tinea Unguium).

How can you catch scalp ringworm?

- **Most cases of scalp ringworm are caught from person to person** via touching, sharing towels, etc:
  - Fungi and their spores can remain alive on combs, brushes, unwashed towels, furniture and sheets for long periods.
  - Some people are carriers of the fungi. That is, they have fungi on their skin and hair but these do not invade into the skin to cause infection or symptoms. However, they may pass the fungi on to others who then do develop symptoms.
  - Sometimes an outbreak of scalp ringworm occurs in families or schools.

- **From animals.** Some dogs, cats and other pets have fungal infections on their skin. They can pass on the infection, especially to children. (Animals can be treated too if you suspect a pet is the cause. See your vet.) Farm animals can also be a source. Touching a farm gate where infected animals pass through may be enough to infect your skin.

- **No apparent reason.** Fungi are common and an infection can occur 'out of the blue'. For example, fungal spores can get into the air from an infected person and land on the scalp of another person. The spores may then develop into fungi and cause infection.

Scalp ringworm mainly affects young children. It is uncommon in adults. This is thought to be because the normal skin oil (sebum) that increases on the scalp in the teenage years (after puberty) has properties that make it resistant to fungi.

What are the symptoms of scalp ringworm?

- Commonly, the infection just looks like severe dandruff on various places on the scalp. This may be mistaken for psoriasis.
- Some infections cause patches of hair loss (bald patches) to develop. The bald patches are usually inflamed and very scaly. Small broken-off hairs may remain scattered in the bald patches.
- In some cases, several painful boils (pustules) develop on the scalp.
- A more severe infection develops in a small number of cases. This causes a large 'boggy' swelling in a section of the scalp, called a kerion. This can be oozing and tender and, if not treated early, can cause permanent scarring and hair loss. (Read more of this below, in the paragraph about complications.)
If you have a severe infection, such as a kerion or pustules, you may develop a high temperature and the glands in the neck may swell.

This photo shows what tinea capitis looks like on the scalp of two African children:

![Image of two African children with scalp ringworm](Image source: Open-i (Coulibaly O et al) - see Further reading below)

This photo shows tinea capitis in the scalp of an Indian boy. Notice the hair loss, grey appearance of the patch on the scalp and the way the fungal infection spreads down onto his forehead:

![Image of an Indian boy with scalp ringworm](Image source: Open-i (Pai VV et al) - see Further reading below)

How is a scalp ringworm diagnosed?

Sometimes the symptoms strongly suggest a fungal infection. However, scalp ringworm may be confused with other problems at first. For example, some cases can look like psoriasis or bad dandruff and fungal infection is just one of several causes of bald patches and hair loss. To confirm the diagnosis, a doctor will usually send a hair sample or a scraping of affected skin to the laboratory. This is looked at under the microscope and cultured to confirm that a fungal infection is the cause of the problem.

General advice if you are diagnosed with scalp ringworm

If you are confirmed or your child is confirmed as having scalp ringworm then:

- Where possible, you should throw out or disinfect (with bleach) objects that may be contaminated with fungal spores - for example, hats, combs, pillows, blankets and scissors. This aims to prevent re-infection after treatment and to prevent passing on the infection to others.
- You should not share towels. Wash used towels frequently.
- It is not necessary to keep children off school. However, to ensure that the infection is not transmitted to others, they should carefully follow the recommended treatment.
- Monitor the scalps of other children in the household. If there are any signs of scaling or hair loss then seek medical advice.
- If a pet is suspected of being the source of the fungal infection then seek advice from a vet for treatment.

What is the treatment for scalp ringworm?

**Antifungal medicines**

An antifungal medicine taken by mouth is needed to clear scalp ringworm. They usually work well.

- **Griseofulvin** has been the first choice of treatment for scalp ringworm for many years. An 8- to 12-week course of griseofulvin is usually needed. At the moment there is no liquid form available but the tablets can be taken crushed, if necessary mixed with a little water, for children unable to swallow them whole.
- **Terbinafine** is another option which is being increasingly used instead of griseofulvin. Strictly speaking, it is not licensed for this purpose but it is an effective treatment. A four-week course is usually needed. It is important to finish the course to clear the fungus completely from the scalp.

Other antifungal medicines, such as *itraconazole* and *fluconazole*, are sometimes used.

Antifungal medicines are generally well tolerated and side-effects are uncommon. However, they do occur in some people and some people should not take them at all. For example, women of childbearing age should not become pregnant during (and for one month after) treatment with griseofulvin. Men should use contraception during (and for six months after) their own treatment with griseofulvin, as it has known to damage sperm.

Therefore, read the leaflet that comes with the medicine packet for a full list of cautions and possible side-effects before taking any treatment.

**Antifungal creams and shampoos**

Antifungal creams or shampoos do not clear the infection fully. This is because fungi get into the hair shafts where creams and shampoos cannot reach. Therefore, they cannot cure the condition. They do, however, clear fungi and fungal spores from the hairs and surface of the scalp.

An antifungal shampoo or cream may be advised twice-weekly for a couple of weeks in addition to antifungal medication - for example, selenium shampoo, ketoconazole shampoo or terbinafine cream. This is to clear any surface fungi quickly and make it much less likely for the fungus to spread to other children.

**Are there any possible complications?**

If the infection is not treated and becomes severe, there is a risk of some permanent scarring and patches of hair loss (bald patches) remaining on the scalp even after treatment.

Sometimes the fungal infection beds down deeply into the scalp, which responds by creating a very sore, thick bumpy mass of fungal infection called a kerion. This can look like a cluster of boils and be mistaken for a bacterial infection, when the actual infection is caused by a fungus. Antibiotics will not help for a kerion: you need antifungal tablets like terbinafine or griseofulvin. This image shows a kerion in a young boy in Iran:

![Image source: Open-i (Babamahmoodi F et al) - see Further reading below](image-url)
Very occasionally the inflammation caused by a fungal infection can lead on to a 'secondary' bacterial skin infection. If this occurs then
you may need a course of antibiotics.

What about close contacts of affected people?

Some people with no symptoms may be contaminated with fungi in their hair. These people are called 'carriers'. Therefore, household
members and other close contacts of an affected person may be advised to have a simple test. That is, a special brush may be used on
their hair which is then sent to the laboratory to see if their hair is contaminated with fungi or fungal spores.

Treatment may be offered if fungi or fungal spores are detected, to prevent the disease from 'taking hold' or from spreading to others.
For example, some people found to have a heavy growth or high spore count may be advised to take a course of antifungal tablets.
Others with a low count may be treated with just an antifungal shampoo or cream. But note: this measure is for close contacts, such
as brothers and sisters. Screening in schools where an affected child attends is not usually needed. However, if more than two children
in a class are infected, the rest of the class may be screened by scalp brushing (after parental consent).

Further reading & references

- Guidelines for the management of tinea capitis 2014; British Association of Dermatologists (Sept 2014)
- Fungal skin infection - scalp; NICE CKS, September 2014 (UK access only)
  (4):CD004685.
- Tinea capitis in the United Kingdom: a report on its diagnosis, management and prevention; Health Protection Agency, 2007 (archived content)

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