

# Dandruff



Dandruff is the shedding of dead skin cells from the scalp. As skin cells die, a small amount of flaking is normal; about 487,000 cells/cm<sup>2</sup> get released normally after detergent treatment. Some people, however, experience an unusually large amount of flaking either chronically or as a result of certain triggers, up to 800,000 cells/cm<sup>2</sup>, which can also be accompanied by redness and irritation.

Dandruff is a common scalp disorder affecting almost half of the population at the post-pubertal age and of any gender and ethnicity. It often causes itching. It has been well established that keratinocytes play a key role in the expression and generation of immunological reactions during dandruff formation. The severity of dandruff may fluctuate with season as it often worsens in winter. Most cases of dandruff can be easily treated with specialized shampoos. There is, however, no true cure.

Those affected by dandruff find that it can cause social or self-esteem problems, indicating treatment for both psychological and physiological reasons.

## Signs and Symptoms

The signs and symptoms of dandruff are an itchy scalp and flakiness.

## Causes

Dandruff can have several causes, including dry skin, seborrheic dermatitis, not cleaning/scrubbing often enough, shampooing too often, psoriasis, eczema, sensitivity to hair care products, or a yeast-like fungus. Dry skin is the most common cause of flaking dandruff.

As the epidermal layer continually replaces itself, cells are pushed outward where they eventually die and flake off. For most individuals, these flakes of skin are too small to be visible. However, certain conditions cause cell turnover to be unusually rapid, especially in the scalp. It is hypothesized that for people with dandruff, skin cells may mature and be shed in 2–7 days, as opposed to around a month in people without dandruff. The result is that dead skin cells are shed in large, oily clumps, which appear as white or grayish patches on the scalp, skin and clothes.

According to one study, dandruff has been shown to possibly be the result of three factors:

- 1.Skin oil commonly referred to as sebum or sebaceous secretions
- 2.The metabolic by-products of skin micro-organisms (most specifically Malassezia yeasts)
- 3.Individual susceptibility and allergy sensitivity.

Older literature cites the fungus *Malassezia furfur* (previously known as *Pityrosporum ovale*) as the cause of dandruff. While this species does occur naturally on the skin surface of both healthy people and those with dandruff, in 2007 it was discovered that the responsible agent is a scalp specific fungus, *Malassezia globosa*, [14] that metabolizes triglycerides present in sebum by the expression of lipase, resulting in a lipid byproduct oleic acid (OA). During dandruff, the levels of *Malassezia* increase by 1.5 to 2 times its normal level. Penetration by OA of the top layer of the epidermis, the stratum corneum, results in an inflammatory response in susceptible persons which disturbs homeostasis and results in erratic cleavage of stratum corneum cells.

### **Seborrhoeic dermatitis**

In seborrhoeic dermatitis redness and itching frequently occur around the folds of the nose and eyebrow areas, not just the scalp. Dry, thick, well-defined lesions consisting of large, silvery scales may be traced to the less common affliction of the scalp psoriasis.

Inflammation and extension of scaling outside the scalp exclude the diagnosis of dandruff from seborrhoeic dermatitis. However, many reports suggest a clear link between the two clinical entities - the mildest form of the clinical presentation of seborrhoeic dermatitis as dandruff, where the inflammation is minimal and remain subclinical.

Seasonal changes, stress, and immuno-suppression seem to affect seborrhoeic dermatitis.

### **Mechanism**

Dandruff scale is a cluster of corneocytes, which have retained a large degree of cohesion with one another and detach as such from the surface of the stratum corneum. A corneocyte is a protein complex that is made of tiny threads of keratin in an organised matrix. The size and abundance of scales are heterogeneous from one site to another and over time. Parakeratotic cells often make up part of dandruff. Their numbers are related to the severity of the clinical manifestations, which may also be influenced by seborrhea.

### **Treatment**

Shampoos use a combination of special ingredients to control dandruff.

- Antifungals :A number of antifungal treatments have been found to be effective including: ketoconazole, zinc pyrithione and selenium disulfide. Ketoconazole as a shampoo appears to be the most effective.

Ketoconazole is a broad spectrum, antimycotic agent that is active against both Candida and M. furfur. Of all the imidazoles, ketoconazole has become the leading contender among treatment options because of its effectiveness in treating seborrheic dermatitis as well.

- Ciclopirox is widely used as an anti-dandruff agent in most preparations.

- Coal tar : Coal tar causes the skin to shed dead cells from the top layer and slows skin cell growth.

- Egg oil: In traditional Indian and Chinese medicine, egg, oil was used as a treatment for dandruff, but there is no evidence to indicate that it works.

Dandruff affects up to half of adults.

### **Dandruff Treatment**

Dandruff is harmless, so you can treat it at home without a prescription.

Two of the quickest ways to get started are to brush your hair and try a dandruff shampoo.

Brush your hair from your scalp down with steady, firm strokes. This will carry oil from your scalp, where it can cause dandruff, along the hair strands, where it will keep your hair shiny and healthy.

### **Dandruff Shampoos**

Not all dandruff shampoos are alike. Some have different active ingredients, such as:

- Coal tar preparations ( Denorex Therapeutic Protection, Neutrogena T/Gel, Scytera)
- Pyrrithione zinc ( Selsun Blue for Itchy Dry Scalp, Neutrogena T/Gel Daily Control Dandruff Shampoo, Head & Shoulders)
- Salicylic acid and sulfur ( Sebex, Sebulex)
- Salicylic acid (Neutrogena T/Sal )
- Selenium sulfide ( Dandrex, Head & Shoulders Clinical Strength, Selsun)
- Ketoconazole ( Extina, Nizoral A-D, Xolegel)

You may need to switch between types of shampoos if one type controls the dandruff at first but later loses its effectiveness.

How often you should use dandruff shampoo varies from daily to a couple of times a week. Check the directions on the bottle.

When shampooing your hair, rub the shampoo into your scalp well. Leave the shampoo on your head for 5 minutes, or as directed, before you rinse.

Rinse thoroughly. Any leftover shampoo may irritate your skin.

Once your dandruff is under control, you may be able to use the dandruff shampoo less frequently.

### **When to See a Doctor**

If you're still scratching and shedding after trying over-the-counter preparations, see your doctor. For really stubborn dandruff cases, you may need to use a prescription shampoo or topical medication.

- Moisturizing:** Moisturizing lotions don't do much more than smooth out scales and make plaques look redder.

- Switching brands of shampoo:** Shampoo doesn't cause dandruff. However, medicated shampoos (see below) can help.

- Changing hair-care routines:** There is no "right" shampoo or conditioner. What is more important is the frequency with which these agents are used. As a rule, the more frequently one shampoos, the better the result. Seborrhea and dandruff are not caused by excessive shampooing "drying out the scalp." Hair dyes and conditioners do not cause or aggravate dandruff.

- Switching antiperspirants:** When underarms are red from seborrhea, almost anything will make them redder, including antiperspirants, even though they are only aggravating the seborrhea and not causing it.

**What over-the-counter products can help dandruff?**

1.**Shampoos:** Here are some ingredients in medicated shampoos that you can look for to help control dandruff of the scalp. All are available over the counter.

- Tar (T/Gel)
- Salicylic acid (T/Sal)
- Zinc pyrithione (like Head & Shoulders)
- Selenium sulfide (Selsun Blue)
- Ketoconazole (Nizoral)

One can use any of these either all of the time or just once or twice a week, depending on how severe the symptoms are. If the problem quiets down or disappears, use unmedicated shampoos. If one kind of shampoo works for a while and "runs out of gas," switch to another. For resistant cases, alternate two different types.

2.**Creams:** Two additional types of medication that help seborrhea are cortisone creams and antifungal creams.

- Corticosteroid creams reduce inflammation. These can be purchased over the counter in either 0.5% or 1% concentrations. They are safe to use on the face and will often help in just a couple of days when applied twice daily. These products also are available as scalp lotions that are applied once a day, preferably on damp hair after shampooing. One can use scalp corticosteroid creams together with medicated shampoos.
- Antifungal creams are often effective, apparently because they reduce the number of yeast organisms living on the skin. Over-the-counter creams include 1% clotrimazole cream andmiconazole cream 2%. Antifungal creams also are applied once or twice a day.

As with shampoos, creams should be applied until the seborrhea subsides. When the seborrhea comes back (and it will, sooner or later), the creams should be used again.

## References

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