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## Other Hair Loss Causes

A wide range of factors other than genetics can result in hair loss, and many of these conditions are temporary and can be effectively treated by a dermatologist. Diffuse non-scarring loss is usually androgenetic alopecia in men and women but can include telogen effluvium, and systemic diseases such as thyroid, iron deficiency, dermatomitis. Patchy scarring loss can be due to folliculitis (bacterial infection of the hairs), lichen planar and discoid lupus. Patchy non-scarring alopecia can be due to ringworm, trichotillomania, traction alopecia, and syphilis. Hair loss causes that are not based on genetics are discussed in this chapter, including the following:

- Autoimmune disorders
- Diseases
- Nutritional deficiencies
- Poisons
- Prescription drugs
- Chemotherapy drugs
- Radiation exposure
- Stress
- Physical trauma to the scalp
- Hair loss following childbirth
- Psychological
- Hair styling techniques
- Hair styling products

# AUTOIMMUNE DISORDERS

Autoimmune disease occurs when the body's immune system mistakenly attacks itself. In a fairly common autoimmune disorder called alopecia areata, the white blood cells attack the deepest part of the hair follicle, commonly referred to as the bulb area, resulting in temporary hair loss.

Alopecia areata is probably the second most common cause of hair loss after androgenetic alopecia (inherited predisposition for hair loss). Most people affected by alopecia areata first develop one or two small bald patches on their scalp which persist for several months, after which they eventually re-grow hair in those areas.



*Alopecia areata*

Frequently the size and duration of the bald patches increase with subsequent episodes of the disease. Some people with this condition may suffer larger and more persistent bald patches in their very first episode, and some lose all the hair on their scalp, a condition called alopecia totalis. Even more extreme is the loss of all body hair, called alopecia universalis. In some cases the hair loss persists for long durations; nevertheless there is always the possibility of hair regrowth because the inflammation occurs in the bulb area of the hair follicle, which is regenerated with each hair follicle growth cycle.

The National Alopecia Areata Foundation estimates that variations of this condition will affect approximately two percent of the population at some point in their lives, usually beginning during childhood. Hair loss from alopecia areata is not life threatening; however, the bald patches occur suddenly and recur unpredictably causing profound psychological disruptions in the lives of many people affected. The loss of hair due to alopecia areata in children can be psychologically devastating. Treatments with medications such as cortisone injections and minoxidil lotion have limited success.

Treated bald patches may regrow new hair; however new bald patches on other parts of the scalp often occur soon after. Some people with alopecia areata choose to wear their scalp bald, shaving what hair they have. For adults with extensive or total hair loss, there are also cosmetic options such as hats, turbans, scarves, and full-cap wigs that cover the entire scalp. Wigs have several drawbacks as a treatment for young children with alopecia areata. Wigs are fragile and expensive, and can be treated roughly by young children. But more significantly, wigs present a psychological issue for young children in that they suggest that the child is “not OK” as they are. Regardless of whether the affected child chooses to cover their scalp or not, it is beneficial to educate their classmates at school about the condition to temper the inevitable—and usually unwanted—attention that hair loss at a young age attracts.

Another autoimmune disease that can result in hair loss is lupus erythematosus. This autoimmune disease affects the bulge area of the hair follicle rather than the bulb, and can cause permanent hair loss. A dermatologist should treat autoimmune conditions affecting the hair.

### OTHER DISEASES

In addition to autoimmune diseases, a wide variety of other disease conditions can cause hair loss.

Fungal infections on the scalp such as ringworm (*tinea capitis*), kerion, and favus can result in hair loss. Bacterial infections on the scalp such as folliculitis, furuncles, and carbuncles can cause thin hair. Skin cancers—such as metastatic carcinoma and sclerosing basal cell carcinoma—can also cause hair loss.

In rare cases, certain skin diseases such as severe eczema, and lichen planus (which is called lichen planopilaris when it affects the scalp), and psoriasis can result in hair loss. Thyroid and endocrine gland disorders such as hypothyroidism and hypopituitarism can result in thin hair and brittle hair that breaks easily. Leprosy, shingles (*herpes zoster* infection), and advanced stages of syphilis have all been noted to cause hair loss.

### NUTRITIONAL DEFICIENCIES

Nutritional deficiencies are rarely a cause of hair loss despite the marketing of a wide variety of nutritional supplements that claim to somehow enhance hair growth or hair health. Of the possible nutritional deficiencies that can cause thinning hair, iron deficiency anemia is most common, and when it occurs it is more frequently seen in women. Iron deficiency anemia is a result of a decreased amount of red blood cells in the blood because of inadequate iron reserves in the body.

There are several causes for this condition, including inadequate consumption of iron-containing foods, poor absorption of iron in foods or supplements, and loss of blood.

The main sources of iron in a typical western diet include meat, egg yolks, poultry, fish, legumes (lentils, dried peas and beans), whole grains, iron-fortified cereal products and iron-containing multivitamin tablets. Poor absorption of iron can result from disease conditions or from certain medications that interfere with iron absorption. Low red blood cell count from periodic blood loss can contribute to anemia because the body normally recycles the iron in worn out red blood cells. If the blood is lost, the iron in those cells is lost as well.

Menstruation is the most common cause of blood loss-induced iron deficiency anemia; however, blood loss can also result from injury, frequent donation of blood, and internal bleeding from digestive system ulcers and various disease conditions.

The first step in determining if iron deficiency anemia as a cause of a hair loss condition is a blood test for ferritin levels. Ferritin is an iron-storing protein that circulates in the blood and reflects the body's iron reserve level. Just taking an iron supplement is not likely to stop hair loss. If a serum ferritin blood test indicates a deficiency, the next step is to determine the cause of the iron deficiency, and to effectively treat the condition. Many doctors and laboratories assume the normal range of serum ferritin to be 10-230 grams per liter. But in the past few years it has been found that women with levels below seventy have an increased chance of hair loss. Inadequate dietary iron can be treated with iron supplement tablets however, iron absorption problems may require switching medications or injections of iron supplements, and blood loss treatments vary according to the cause.

In addition to iron deficiency anemia, severe "crash" diets, and psychological disorders that result in extreme nutritional imbalances such as anorexia and bulimia, can also result in hair loss. Going without food for several days, or even several weeks, will not cause hair loss. But severe swings in nutrition and body weight from "crash" diets over several months time may begin to affect hair condition.

*The American Journal of Clinical Nutrition* published a study of two adult hospital patients who were unable to use their intestines to digest food. The patients were fed intravenously a diet that happened to be deficient in the B-complex vitamin biotin. Biotin deficiency is extremely rare because in addition to being present in many types of food, it is also manufactured by the friendly bacteria that live in normal intestines. Because these patients had inactive intestines, their intestinal bacteria did not produce adequate biotin, and they suffered hair loss as a result. When biotin was added to the intravenous diet, hair growth resumed.

With most nutritional deficiency-caused hair loss, hair growth resumes with adequate consumption of the missing nutrient.

### POISONS

Certain poisons can cause hair loss when consumed in less than lethal doses. In many cases, hair loss is one of the first signs of poisoning. Warfarin, a common ingredient in commercial rat poisons, can cause hair loss when consumed in large amounts by humans. It is prescribed in smaller amounts for humans as a medicine used for thinning the blood.

Certain metal salts and heavy metals including arsenic, mercury, bismuth, lithium, thallium, cadmium, and gold are poisonous, and can cause hair loss as a result of prolonged inhalation in industrial environments or by ingestion. Organic forms of metal salts tend to be more readily absorbed and more slowly eliminated, and are more toxic. Arsenic is used in glass manufacturing, metal refining, silicon chip manufacturing, insecticides, rat poisons, fungicides, and wood preservatives. Arsenic poisoning has resulted from ingestion, and also from inhaling fumes from arsenic-preserved wood intended for outdoor use. Mercury poisoning has resulted from consumption of mercury-containing seafood and also from exposure to mercury-containing medications, paint, fungicides and industrial products. Prior to 1972, thallium sulfate was a common ingredient in pesticides and rat poisons, and poisoning from accidental ingestion by children was often discovered as a result of their hair loss. Consumption of 50,000 to 250,000 Units of vitamin A daily over many months can cause hair loss. Boric acid, a common household pesticide, can cause hair loss when consumed over a period of time.

### PRESCRIPTION DRUGS

There are many categories of prescription drugs that present a risk of temporary hair loss as a possible side effect. Chemotherapy drug treatment almost always causes hair loss because the drugs target rapidly dividing cells typical of cancer. See Chapter 8 and Appendix 2 for a complete discussion.

### RADIATION EXPOSURE

Ionizing radiation such as the type used for cancer treatment, also affects rapidly dividing cells most severely, and, as a result of expo-

sure to radiation, actively producing hair follicles are shut down. The amount of hair loss from radiation exposure varies, however.

With radiation treatment, only hair that is in the treatment field is affected. When the treatment field includes the scalp, hair loss generally begins about two to three weeks after the first radiation treatment. Usually the hair begins to grow back three to four months after the last treatment; however, with high doses of radiation, there is a risk of permanent hair loss in the treatment area.

## STRESS

Stress can cause a type of hair loss called telogen effluvium. This condition is not caused by the general accumulated stress of ordinary interactions with people at home and at work, but rather by sudden severe emotional or physiological incidents. Severe stressful events can cause some or most actively growing hair follicles to prematurely shift into the regression phase, and then the resting phase, during which the hairs fall out easily.

There is usually a delay of a few weeks to a few months before the shedding is noticeable, but after this delay the shedding seems to occur quite suddenly. Because the shedding is delayed, this type of hair loss is often a mystery to the person suffering the condition. The stressful event that triggered it is frequently forgotten, and it is rarely thought to be connected with the “new problem.”

Examples of sudden severe emotionally stressful events include the death or terminal illness of a family member or close friend, marriage, divorce, and unexpected job loss. Severe physiological stressful events shock the body, and some examples are heart attacks, major surgery, and illnesses with prolonged high fever such as malaria, viral pneumonia, and severe cases of the flu.

In most cases of telogen effluvium, the hair follicles recover and soon shift back to the regular growth cycle.

However, repeated instances of telogen effluvium can result in premature hair loss in people predisposed to lose their hair late in life. The average growth cycle of a hair follicle takes about five years, but each follicle is “genetically programmed” for only a limited number of growth cycles. For example, if a particular hair follicle were “geneti-

cally programmed” for only ten growth cycles, after about fifty years that follicle would stop producing new hairs. When all the follicles at the hairline or crown of the head are “genetically programmed” this way, a receding hairline or bald spot appears after all the growth cycles for the follicles in those areas have been cycled through.

Each incidence of telogen effluvium uses up one “life” of the affected hair follicles. So instead of having a receding hairline or bald spot at age fifty, the hair loss may occur a few years earlier. This is not a significant issue if telogen effluvium occurs once or twice in a lifetime; however, accelerated hair loss can result from repeated severe stressful events, if each instance triggers a new round of telogen effluvium.

I had a patient who was totally bald when I met him at age seventy, and he had lost all his hair by age twenty-two. He had worked on the Panama Canal fifty years earlier, and for two straight years starting when he was twenty he suffered repeated bouts of severe fever from episodes of malaria. Each time he suffered from malaria induced fever he experienced telogen effluvium, lost what hair he had, and his hair follicles lost another “life.” After ten or fifteen malaria stress cycles, at the age of twenty-two, he had the hair he would have had at age seventy. Which unfortunately for him was no hair at all.

## PHYSICAL TRAUMA TO THE SCALP

Physical trauma to the scalp, such as from wounds from accidental cutting or impact, thermal burns from heat or fire, chemical burns from acids, alkalis, or other caustic substances, and from freezing due to exposure to severe cold or liquefied gas such as liquid nitrogen can cause permanent hair loss. Continuous pressure on the scalp from a tight fitting helmet or other headgear worn every day can in some people cause permanent hair loss. Hair loss due to a tight fitting helmet will cause loss only at the site of too much pressure and is a result of friction and pressure breaking the hair shafts. This will not cause permanent baldness unless prolonged pressure prevents blood from getting to the hairs. Newborn babies sometimes have a one-inch bald spot on the side of the head from prolonged pressure against the side of their mother’s pelvis. Lastly, trauma injuries can be the result of elective cosmetic surgery, such as from synthetic fiber implants, improperly performed hair transplants, or radical scalp lifts that result in scalp tissue death.



Usually there are only two types of treatment for physical trauma to the scalp. One is surgery: Either cutting out the injured area by performing a scalp reduction procedure, or by placing hair transplant grafts into the scar tissue at the injured area. The second option is a hairpiece or full cap wig.

## HAIR LOSS FOLLOWING CHILDBIRTH

Childbirth often causes a temporary form of hair loss called postpartum telogen effluvium. During the second and third trimester of pregnancy, hair follicles on many women remain in the active growing phase, rather than enter the resting and shedding phases, as they normally would have.

During pregnancy this results in a higher proportion of actively growing hair follicles, and thicker more luxuriant hair. However, within one to three months following childbirth, the hair follicles go back to their regular growth cycle. All the follicles that would have been resting and shedding over the previous six months or so stop growing all at the same time, and a larger than usual amount of hair is shed.

Discontinuation of some birth control pills can also result in hair shedding, because some oral contraceptives mimic to some degree the hormonal effects of pregnancy. The condition is temporary, but can be disturbing to new mothers, who already have their hands full taking care of a new baby.

## PSYCHOLOGICAL

A somewhat mysterious type of hair loss results from compulsive hair pulling, a psychological condition called trichotillomania. Young children may exhibit this behavior in response to anxiety. Counseling to address the issues causing anxiety is the best long-term treatment; however cutting the hair short to make pulling more difficult may also help in the short term.

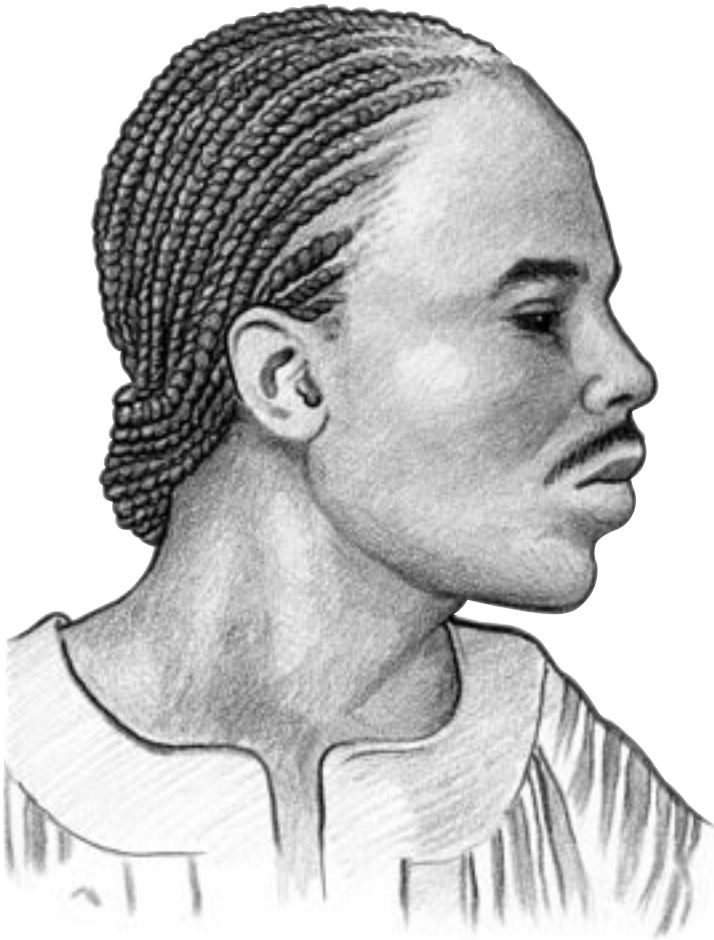
## HAIR STYLING TECHNIQUES

A type of hair loss called traction alopecia can result from certain hair-styling techniques that pull tightly on the hairs, such as tight “cornrow” braids and pigtails. Modifying these styling techniques so that they are not too tight solves the problem.

## Chapter Four

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Cosmetic products and procedures that weaken or damage the hair shaft can result in hair loss. For example, highly alkaline hair-relaxers and straighteners, as well as acidic permanent wave treatments, can cause hair loss. Hair bleaching and coloring agents, when used excessively, can weaken the hair shaft and result in breakage and hair loss. Hair growth resumes after the products are discontinued.



*Cornrow braids*