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The Cause of Most Hair Loss

The most common type of hair loss occurs in a predictable pattern, and pattern hair loss occurs when the normal cycle of hair growth changes. Usually pattern hair loss starts slowly, and continues to get progressively worse. Progressive pattern hair loss is a common occurrence among men, and less apparent but still quite common among women. While men typically suffer pattern baldness with receding hairlines and bald spots on the crown of the head, women typically experience generalized thinning hair over the entire top of the head. And as we age, the occurrence and degree of hair loss increases.

There have been numerous causes blamed for pattern hair loss, including “hot blood,” excessive blood circulation in the scalp, inadequate blood circulation in the scalp, wearing hats, brushing the hair too much, brushing too little, dirty scalps, oily scalps, hormones in scalp oil, dandruff, various diseases, excessively tight scalps, inadequate oxygen reaching the hair follicles, inadequate nutrition or nutritional deficiencies, “sleeping” hair follicles, and hairs “stuck” in the hair follicles, to name just some of the “hair loss causes” offered by scientists and charlatans over the years. Chapter 5, “Hair Loss Treatment History,” presents a sample of the hundreds of “remedies” that over the years have been offered to those suffering from hair loss. Most of these “cures” are based on “hair loss causes” that simply are not true.

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And while it is true that there are many possible reasons for a particular individual's hair loss, including real diseases, certain medications, and even hair loss as a reaction to severe stressful incidents, the vast majority of those suffering progressive hair loss, or pattern baldness, have simply inherited the tendency for hair loss from their parents. The cause of most hair loss is genetics. Almost all pattern hair loss is caused by heredity, from genes passed on by both maternal and paternal ancestors.

Hair loss caused by disease, medication, and stress are discussed in Chapter 4, "Other Hair Loss Causes," and a board certified dermatologist should treat these conditions. A dermatologist is a medical

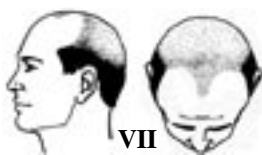
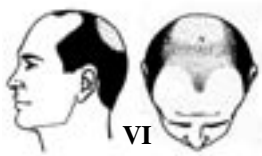
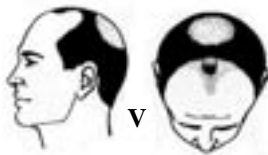
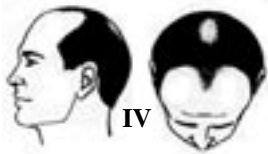
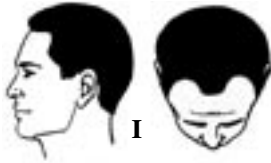
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doctor trained specifically to diagnose and treat conditions affecting the hair, skin, and nails. If you suspect that your hair loss is due to something other than genetics, schedule an examination with a dermatologist. Information on selecting a doctor is presented in Chapter 17, "Choosing a Physician."

Most people with hair loss simply have a genetic tendency to start losing hair at a certain age, a condition that if untreated will get progressively worse. An understanding of this truth will help you to determine what you can really do about your hair loss.

Almost everyone suffers from a tendency for hair loss to some degree, as very few of us when we are in our fifties, sixties, and seventies will have the hair we had in our teens. The degree of hair loss becomes more apparent as we age. Those individuals with a greater genetic predisposition for hair loss usually start losing their hair earlier and to a greater degree, than those with a lesser genetic predisposition.

By age twenty-five, approximately twenty percent of men will show some signs of hair loss, but by age sixty the percentage will climb to about seventy-five percent. Of the seventy-five percent of men showing signs of hair loss by age sixty, about half these will have significant baldness on the front and top of their heads. Women also



*Norwood scale for male
pattern hair loss*

experience hair thinning as a result of their hair follicle's genetic programming; noticeable hair loss however, in women typically occurs after menopause.

While the entire genetic mechanism that causes hair loss is not completely understood, we do know that in individuals with pattern hair loss, certain hair follicles are genetically programmed to be more sensitive to a hormone circulating in the blood called dihydrotestosterone, commonly abbreviated as DHT. DHT is one of several hormones classified as androgens, often referred to as "male" hormones. DHT is formed from testosterone, the most well known androgen. While men past puberty have higher levels of androgen hormones in their blood than women, it is normal for women to have some androgens, including both testosterone and DHT, circulating in their blood. Just like men with pattern baldness, some women inherit hair follicles with a genetic sensitivity to DHT, which signals pattern hair loss to their DHT-sensitive hair follicles.

The cause of pattern hair loss in both men and women is DHT in the blood signaling hair follicles genetically programmed to be sensitive to DHT to stop growing new hairs.

Hair follicles sensitive to DHT must be exposed to a high enough level of DHT in the blood over a long enough period of time before they get the message to start shutting down. And the message has to continue for years before a hair follicle completely stops producing new hairs. Some hair res-

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toration medications interfere with the conversion of testosterone to DHT reducing the strength of the DHT message, and others block the receptor sites on hair follicle cells so the DHT message does not get through. But even in men and women with a strong inherited tendency for pattern hair loss, there are hair follicles that are not sensitive to DHT, and these follicles continue to grow new hairs for a lifetime.

In men with pattern baldness, the hair follicles that are most sensitive to DHT are generally located at the temples, the hairline, and on the crown of the head. This “pattern” of sensitive hair follicles in men is the reason the condition is commonly called “Male Pattern Baldness.”

In women with pattern hair loss, the DHT-sensitive follicles are distributed over a wider area, and the hair loss pattern is less defined. Usually there is generalized thinning over the entire top of the head, with less thinning along the sides and on the back of the head. Women with an inherited tendency for hair loss typically have follicles sensitive to DHT distributed over the tops of their heads.

Normal hair follicles go through a growth cycle (described in the previous chapter) that lasts roughly four to six years, ending with the hair shaft being shed, and a brief resting period after which the

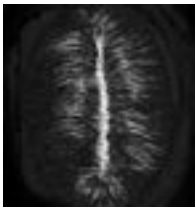


Ludwig Scale for female pattern hair loss

growth cycle starts over again with a new hair beginning to grow from the hair follicle.

But hair follicles that are sensitive to DHT, and that receive the DHT message to shut down, begin to have shorter anagen (growth) phases. The DHT circulating in the blood seems to signal these sensitive hair follicles to stop growing hair before the normal growth phase would have ended. Instead of four to six years, the growth cycle shortens to three to four years, and then one to two years, and eventually the hair follicles affected by DHT simply stop producing new hairs altogether, and stay in a sort of telogen (resting) phase. As the growth phase of the follicles becomes shorter, the hairs grown by those follicles do not grow as long as they once did.

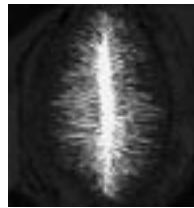
Scalp hairs grow approximately one-half inch per month, which works out to about six inches per year. If the growth phase of a follicle is six years long, the hair grown by that follicle could reach thirty-six inches in length if it were not cut. But if the growth phase shortens to two years, the maximum length of the hair would be only twelve inches. Eventually, as the anagen phase continues to shorten, the hairs produced by the hair follicle may only grow out an inch or less before they are shed.



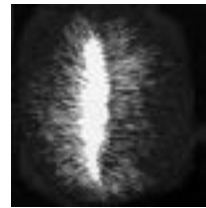
Savin D1



Savin D2



Savin D3



Savin D4



Savin D5



Savin D6



Savin D7

*The Savin Scale
hair loss density
scale is used for
men and women*

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It is believed that each hair follicle is genetically programmed for a limited number of growth cycles. The shorter the duration of each cycle, the sooner a particular hair follicle goes through all of its growth cycles and stops producing a new hair.

For example, if a particular hair follicle is programmed to have twenty complete growth cycles, each lasting an average of five years, then that hair follicle will continue producing new hairs for 100 years (twenty growth cycles at five years each). But if that hair follicle is sensitive to DHT circulating in the blood, the growth cycles will begin to shorten, and the follicle's twenty-cycle life may only last until age fifty, or forty, or thirty. And some hair follicles are programmed to have fewer than twenty growth cycles, which is why some men start showing frontal hairline recession before age twenty, while other DHT-sensitive follicles continue growing hairs until age thirty or age forty.

But there's more bad news for those who have inherited pattern hair loss. DHT affects sensitive hair follicles in another way as well: it results in thinner and less pigmented strands of hair. Normally, a hair follicle shrinks in size after the anagen (growth) phase, and the hair shaft falls out during the catagen or telogen phase. As the follicle begins a new anagen phase, it grows back to its original size, and it produces a new hair of normal thickness.

There is evidence that hair follicles that are sensitive to DHT do not return to their full size after the telogen phase. In each succes-



Testosterone $\xrightarrow{\text{5-alpha-reductase}}$ DHT
Type I and II

sive growth cycle, the hair follicles become smaller and smaller. This is significant because the hairs produced by these miniaturized hair follicles are themselves thinner and less pigmented than normal hairs. Over time the affected hair follicles only produce nearly transparent “peach fuzz” hairs instead of full size normally colored hairs. And finally they produce no new hairs at all.

So DHT affects sensitive hair follicles two ways: first, it shortens the hair growth cycle, which “ages” the hair follicles. Second, it causes miniaturization of the hair follicles. The result of these two effects are shorter hairs, increasingly finer and less pigmented hairs, and eventually less hair altogether.

But there is still hope for people with pattern hair loss!

First, anybody with partial hair loss can benefit to some degree from careful hair styling, and certain hair care products. And even people with total hair loss can appear to have more hair with the use



*Hair follicles on the front
and top of the head are sensitive to DHT.*

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of a hairpiece or a wig. These cosmetic treatments for hair loss are described in Chapter 7, “Cosmetic Treatments.”

Second, there are certain medications that have been proven to be effective at protecting sensitive hair follicles from DHT, and other medications that reduce the amount of testosterone in the blood being converted into DHT, thereby reducing the amount of DHT in the blood. These medications help to slow hair loss, and in some people, they can actually reverse recent hair loss, sometimes quite dramatically. Medications that stop hair loss and may reverse hair loss are described in Chapter 9, “Drugs that Grow Hair.”

Third, in most people with inherited pattern hair loss, including both men and women, only the hair follicles on the front and top of the head are sensitive to DHT. The hair follicles on the sides and back of the head are not as much affected by the DHT in the blood. It is these DHT-resistant hair follicles on the back and sides of the head that are moved around to the front and top of the head with hair restoration surgery, thereby creating the appearance of a fuller head of hair. The principles and history of hair restoration surgery are covered in Chapters 10 and 11, and the state-of-the-art transplant procedure called follicular unit micrografting is described in Chapter 12.