

## The Intricate Science of Hair: Understanding the Hair Growth Cycle & Causes of Hair Loss

To the untrained eye, hair might seem like a purely aesthetic feature a cascade of strands we wash, cut, style, and sometimes lose without much thought. Yet, beneath the surface of each follicle lies a highly complex biological process that governs the cycle of growth, rest, and shedding. Understanding the hair growth cycle is not merely academic; it's the key to unlocking effective treatments for alopecia and other forms of hair loss that deeply affect individual identity and mental well-being.

### More Than Just a Strand: The Significance of Hair

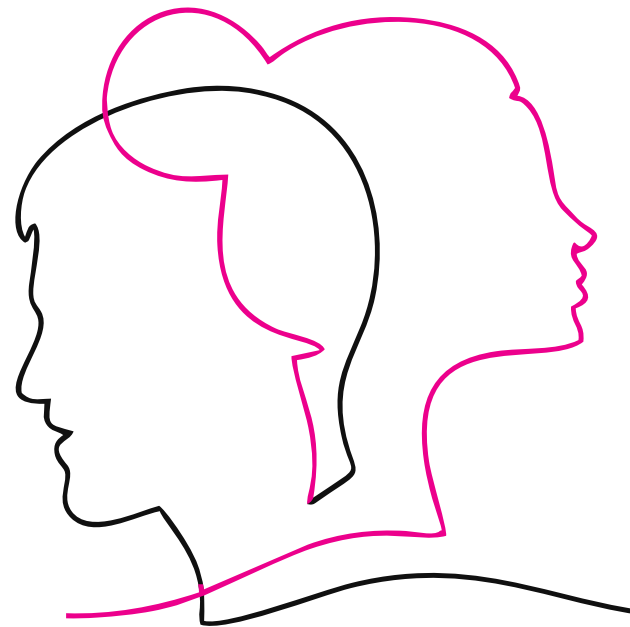
Hair serves limited physiological purposes offering mild protection against ultraviolet radiation, minimizing heat loss, and aiding in tactile sensation. But socially and emotionally, hair holds immense symbolic weight. Shakespeare once quipped, "There's many a man has more hair than wit," but in modern society, many would gladly trade wit for thicker locks. The psychological impact of hair loss cannot be overstated fueling a burgeoning interest in the pathogenesis of alopecia and its therapeutic frontiers.

### An Evolutionary Gift: 5 Million Follicles at Birth

Humans are born with approximately 5 million hair follicles, of which roughly 100,000 reside on the scalp. Remarkably, no new follicles are thought to develop after birth. From the moment hair follicles form in utero, they embark on a lifelong cycle of regeneration governed by a series of distinct stages.

### The Four Phases of Hair Growth

The hair growth cycle comprises four dynamic phases Anagen, Catagen, Telogen, and Exogen each characterized by unique cellular and physiological changes.



## Did you know?

*The average person sheds  
about 50 to 100 hairs a day,  
so don't worry, it's completely normal  
and doesn't mean you're going bald!*

## 1. Anagen Phase - The Growth Engine

Also known as the active or growth phase, the anagen stage is where the magic happens. Cells in the hair bulb proliferate rapidly, generating new hair that pushes up through the follicle. On average, hair grows half an inch per month during this phase, accelerating in warmer months. This phase can last anywhere from 2 to 8 years, depending on genetics and hair type scalp hair enjoys the longest anagen phase, whereas eyebrows and body hair have significantly shorter durations. Impressively, about 85–90% of scalp hairs are in anagen at any given time.

## 2. Catagen Phase - The Transition

This brief transitional phase, lasting approximately 10 days, signals the cessation of active growth. The hair follicle shrinks and detaches from its blood supply, entering a preparatory state for rest. Only 1-3% of scalp hairs occupy this phase at any moment.

## 3. Telogen Phase - The Resting State

The telogen phase, which spans about 2 to 3 months, is a period of biological dormancy. Hair strands remain anchored in the follicle without growing. Concurrently, new hairs begin to form beneath the surface. Approximately 10-15% of hairs are in this resting stage.

## 4. Exogen Phase - The Shedding

A natural extension of the telogen phase, exogen involves the shedding of hair. It's normal to lose 50 to 100 hairs daily during this phase, especially when brushing or washing. Fortunately, this loss is typically counterbalanced by new growth emerging from the anagen cycle, ensuring that the overall hair count remains stable unless the cycle is disrupted.

## When the Cycle Falters: Disruption and Hair Loss

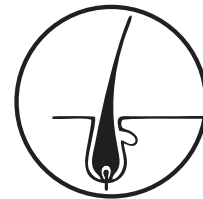
Each hair follicle operates independently, which is why we shed hairs gradually rather than all at once. However, when the hair cycle is disrupted due to stress, nutritional deficiency, illness, or other factors more hairs may prematurely enter the telogen phase. This condition, known as telogen effluvium, results in diffuse hair shedding, often observed 3 months after a trigger like extreme dieting, childbirth, or high fever. Chronic disruption may shorten the anagen phase, preventing hair from reaching its full growth potential and causing noticeable thinning.

### The Many Faces of Hair Loss: Causes and Contributors

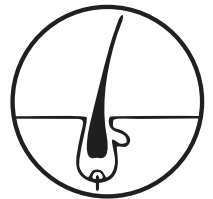
Hair loss, or alopecia, can be temporary or permanent and arises from a complex interplay of genetic, environmental, and medical factors. Key contributors include:

- **Genetics:** The most common culprit, androgenic alopecia, manifests as male or female-pattern baldness and is inherited
- **Hormonal Shifts:** Pregnancy, menopause, thyroid imbalances, and other endocrine changes can lead to hair thinning
- **Medical Conditions:** Autoimmune diseases like alopecia areata, scalp infections (e.g., ringworm), and compulsive hair-pulling (trichotillomania) are significant factors
- **Medications:** Drugs for cancer, depression, arthritis, hypertension, and more may induce hair loss
- **Radiation Therapy:** Treatment to the scalp can permanently alter follicular function
- **Stress and Trauma:** Physical or emotional shock can jolt follicles into early telogen, with noticeable shedding months later
- **Hairstyling Practices:** Tight hairstyles and harsh chemical treatments can cause traction alopecia and follicular damage

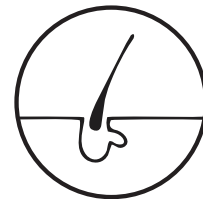
While not life-threatening, hair loss can be profoundly distressing, affecting self-esteem, confidence, and overall quality of life. Individuals may experience anxiety, depression, and social withdrawal, especially when hair is integral to cultural or personal identity.



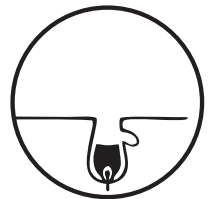
ANAGEN



CATAGEN



TELOGEN



EXOGEN



HEREDITY



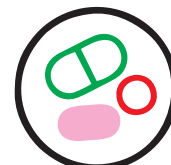
STRESS



MEDICAL CONDITIONS



HORMONAL CHANGES



MEDICATIONS



RADIATION THERAPY



HAIRSTYLES & TREATMENTS

# Hair Today, Gone Tomorrow?

## Busting Myths About Hair Loss with Scien

Hair loss can be an emotional rollercoaster, triggering everything from panic to product splurges. But in a sea of miracle cures and whispered “old wives’ tales,” it’s hard to separate fact from fiction. So, let’s set the record straight—with help from evidence-based medicine.

### **Myth: Hair loss only happens to men.**

While male pattern baldness gets most of the attention, women experience hair loss too and often in silence. According to the American Academy of Dermatology (AAD), up to 40% of women experience visible hair thinning by age 40.

### **Myth: Wearing hats causes hair loss.**

This is more myth than medicine. Hair loss is caused by genetic, hormonal, or autoimmune factors not by your favorite baseball cap. For hats to cause hair loss, they’d have to pull hair tightly and continuously (like in traction alopecia), which regular hat-wearing doesn’t do.

### **Myth: Washing your hair too often makes it fall out.**

You might notice more hairs in the drain, but that’s just natural shedding. Everyone loses 50-100 hairs daily, and washing simply loosens the ones ready to fall.

### **Myth: Plucking one grey hair will result in the growth of two grey hairs.**

Plucking one grey hair won’t cause more to grow. It’s a myth! Each follicle produces just one hair, so if you pluck a grey one, only that same grey hair will grow back.

### **Myth: Stress causes permanent hair loss.**

Extreme stress can cause a condition called telogen effluvium, where more hairs than usual enter the shedding phase. However, it’s usually temporary, and hair regrowth begins within a few months. COVID-19-related hair loss was often due to stress-triggered telogen effluvium, not the virus directly a good example of this mechanism in real life.

### **Myth: Cutting your hair makes it grow back thicker and faster.**

While a fresh trim can make hair look fuller by removing split ends, hair growth is controlled at the follicle level, deep within the scalp. Hair diameter and growth rate are genetically determined and unaffected by scissors.

### **Myth: Using hair products like gel or spray causes hair loss.**

Most styling products are safe when used properly, but poor habits like not washing out product buildup can irritate the scalp. Avoiding alcohol-heavy products, not sleeping with product in your hair, and not overusing heat tools to minimize breakage

### **Myth: There’s no effective treatment for hair loss.**

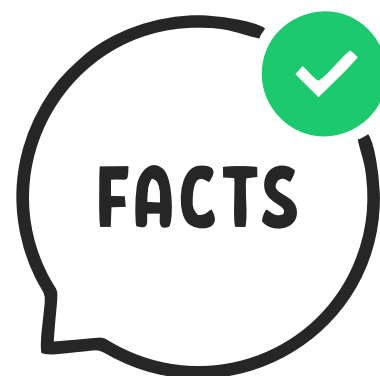
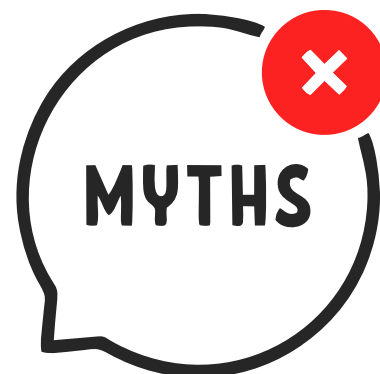
Treatment options exist and some are backed by strong evidence. Minoxidil (topical) and finasteride (oral, for men) are FDA-approved and clinically proven. Platelet-rich plasma (PRP) injections, low-level laser therapy, and hair transplants offer promising results in the right candidates, under medical supervision.

## From the Root to Tip

Hair loss isn’t just about what’s happening on the outside it’s a reflection of what’s going on inside our bodies and lives. Whether it’s triggered by genetics, hormones, stress, or nutrition, the science shows us that hair loss is often a multifactorial issue not something to be blamed on vanity or neglect. Emotionally, it can be tough, especially in a world where hair is tied so closely to identity and confidence. But here’s the empowering part: you’re not powerless.

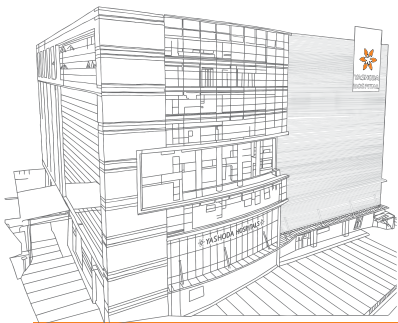
Today’s treatments go far beyond old myths and miracle cures. From topical medications like minoxidil to oral options, platelet-rich plasma therapy, and even hair transplants, science-backed solutions are helping people take control of their hair health. And when combined with lifestyle changes like better nutrition, stress management, and hormonal balance they can be even more effective.

So if you’re experiencing hair loss, don’t suffer in silence. Talk to a healthcare professional, explore your options, and remember: healthy hair starts with a healthy you and every step toward understanding your body is a step toward feeling your best.

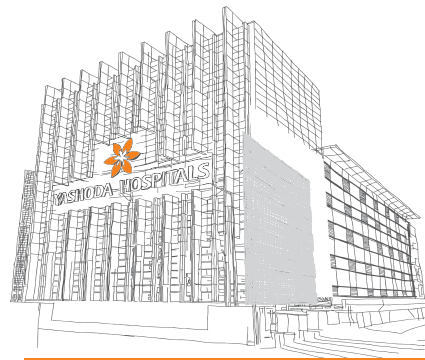




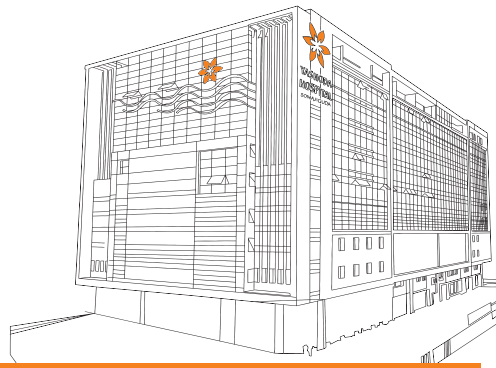
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