



*I'm losing more hair every day. My father is bald
and I don't want to be like that.*

—Kevin, 24, law student

When it comes to hair, we all seem to want what someone else has. Hair may have little real value, except to protect the scalp from the sun. Nevertheless, the huge industry devoted to optimizing the amount of hair we have and the quality of the tresses we bear attests to its social, aesthetic, and emotional importance. We invest a great deal of time and money to remove hair if we have

WISE OLD MAN

Hair is important in every walk of life. It plays a role in the first impressions people make of us. The tale is told of a scholar who was a child prodigy. He was named head of his academy at a very young age, but the students and the faculty were concerned that he was not old enough to have acquired the wisdom for such an important responsibility. God heard these concerns, and one morning the scholar awoke with his hair turned white. He was then accepted as the leader of the academy.

too much; add hair if we have too little; and bleach, color, straighten, and curl hair to help us be who we want to be.

The dermatologist's work does not end at the hairline, nor does the health of your skin. What happens to your scalp and the hair that grows there affects your overall health and appearance. How each of your hairs grow is not necessarily a matter of fate. Understanding the science behind these skin appendages will help you maintain them in the best possible shape.

▪ WHAT IS HAIR?

Strictly speaking, hair is just another fiber. It is alive when growing in the hair follicles just a few millimeters beneath the surface of your scalp; once it has emerged from your scalp to be visible, however, it is no longer living. This is why damaged hair is so hard to treat.

There are about 100,000 hair follicles on the scalp alone. Additional hair follicles are found all over the body, present in every area of the skin except the palms, soles, and lips. From an evolutionary point of view, hair on humans is fur on our mammal cousins. Both coverings emerged to provide warmth.

The hair itself consists of several layers of protein called keratin. The outside of the hair shaft is made up of overlapping layers, like shingles on a roof. There are no nerve endings in the hair shaft, which makes getting a haircut painless.

▪ HOW HAIR GROWS

To learn how hair grows, which is so important to understand all the problems that can develop with your hair, imagine that you are sliding down your hair shaft like a fireman slides down the firehouse pole. In this descent, you come to the hair follicle, which is located just below the dermis in the fatty layer. The follicle consists of a swelling at the very end of the hair shaft, which surrounds a group of capillaries that nourish the hair. This is the area where the hair is actually produced before growing out through the skin. Attached to the hair unit is a sebaceous gland, which supplies the sebum (oil) that gives healthy hair a glossy appearance. (Similar glands in water fowl, such as ducks, produce an oil that is amazingly waterproof and keeps the birds from getting waterlogged.)

At any given time, 90 percent of the 100,000 hairs on the average scalp are growing and 10 percent are resting. The growing hairs continue to do

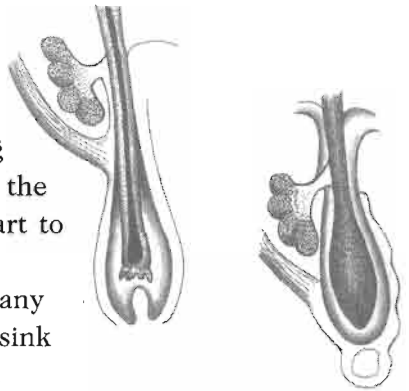
BIRDS OF A FEATHER

An amazing discovery in a remote Chinese province, late in the twentieth century, demonstrated that the need for warmth in small dinosaurs, which actually were warm-blooded, resulted in the development of feathers. These dinosaurs with feathers were actually ancestors of birds. You might say that feathers, fur, and hair are all birds of a feather. The need to insulate the body against piercing cold weather made an extra covering essential, but for humans, hair no longer serves that important purpose.

so for two to five years, at a rate of about half an inch a month. Scalp hair growth in women is slightly faster than in men. At the end of this growing phase, which is called anagen, the hair is shed. For the next three months, the follicle goes into a resting phase, called telogen. At the end of that time, the hair follicle produces a new hair that starts the growth cycle all over again. So it is normal to lose 50 to 100 hairs every day, because when the hair follicle goes from growing (anagen) to resting (telogen), hairs are shed. But remember, the same follicle that has lost a hair will start to produce a new hair three months later.

If you're concerned about how many hairs you are losing, always brush over a sink and count the hairs you find. Also count the hairs you find in the shower, on your pillow, and on your clothes. Do this daily over a week and you will have an idea of whether your hair loss is within normal limits.

Have you ever wondered why your eyebrows and eyelashes don't grow as long as the hair on your head? It is because their growth phase is shorter. There are seasonal variations in hair growth as well. Spring is the time when hair grows most rapidly, and fall is when hair growth is slowest. As we grow older, our hair growth rate slows down. Contrary to popular belief, shaving has no effect on the rate of hair growth.



Hair follicle in growing (left) and resting phase (right). Notice the attached oil gland and band of muscle responsible for goose bumps.

▪ FROM UTERUS THROUGH ADOLESCENCE

Before birth, there is a wave of shedding of scalp hair. By the time of delivery, most newborns have already regrown a full head of hair, although some babies have absolutely no hair at birth. In this situation, the hair cycle is slightly altered and the wave of hair loss *in utero* occurred just a little late—all the hair has not grown back yet, but it will. Two to three months later, infants often have a noticeable patch of baldness on the back of the head. Although this is usually blamed on pressure from lying in the crib on the back in one position, it is just a natural shedding of hair that was never shed before birth, and it also will regrow in a few months.

Before puberty there are two types of hair on the body. *Vellus* hair is fine, usually nonpigmented, and usually not longer than a quarter of an inch. *Terminal* hair is longer, coarser, and often pigmented. In childhood, terminal hair is limited to the scalp, eyebrows, and eyelashes. At puberty, terminal hair replaces the vellus hair, starting in the pubic region. Somewhat later, terminal armpit hair develops in both sexes, and facial hair appears in boys. Subsequently, terminal hair development continues to include the arms and legs of both sexes and the back and chest of men. All of this hair growth is dependent on the increased hormone production associated with puberty.

▪ “DOC, I’M LOSING MY HAIR!!!”

Our hair, like our health, is something we take for granted—until we start losing it, which can be psychologically devastating. I know this from the people who come to my office concerned about hair loss: men—young men still in their twenties—who have noticed their hair thinning or that

HAIR AND RACE

Hair color, texture, and curliness are all genetically determined and vary by race. Asian hair is the thickest and is perfectly circular with a straight hair follicle and hair shaft. African hair is oval, the follicle is curved (helical), and the hair shaft is curly. Caucasian hair is a combination of the other hair types. Asian and African hair is always black, while Caucasian hair varies from blond to black. Blond hair is finer than black hair, but blonds actually have greater numbers of hairs on their scalp.

their forehead is beginning to look higher; women worried about general thinning of the hair or an increased amount of hair in the brush after brushing; parents with a child who has come home from school crying because a classmate has made fun of bald spots that have recently appeared.

Dermatologists often begin to determine the cause of hair loss by taking a good case history. How long has the hair loss been noticeable? Is it the same every day or does it vary from day to day? Is the hair loss localized to certain areas of the scalp or is it more diffuse? Are the hairs actually being shed or are they breaking off? Are there bald spots or just areas that are thinning? Does the scalp look normal or is there redness or scaling?

Is there a family history of hair loss? A detailed history also includes questions about any significant weight loss, medications, recent illnesses, emotional stress, menstrual irregularities, or pregnancy.

▪ COMMON BALDNESS

The most common type of hair loss is referred to as male-pattern baldness (when it occurs in women it is called female-pattern baldness). The condition is known medically as androgenetic alopecia: *andro* is short for androgens, which are the male hormones present in both sexes; *genetic* means this is an inherited type of hair loss; and *alopecia* is a term from the Greek meaning “hair loss.” In men it can start as early as the late teens or early twenties in the form of a receding hairline or a thinning spot on the crown of the head. Recently, such hair loss has been associated with a possible increase in heart disease in some men. Over time, different patterns of hair loss develop, which eventually can lead to a bald scalp with a permanent fringe of remaining hair.

Hair loss in women usually occurs after menopause. It can begin at an early age, with most thinning usually occurring in the frontal and mid-part of the scalp. Significant hair loss in young women may be a sign of hormonal abnormalities related to excessive androgen production or to a thyroid imbalance. Every young woman with significant hair loss should have a complete checkup to rule out an underlying medical cause—abnormalities of the ovaries or the adrenal or thyroid glands need to be ruled out. Associated symptoms that suggest that such hormonal imbalance may exist include irregular periods, acne, and excessive facial or body hair.

Since androgenetic alopecia does not occur without the presence of androgens, the problem does not exist until after puberty. Many older medical textbooks say the inheritance of common baldness comes only from

the maternal side, but in fact baldness can be inherited from either side of the family. The actual gene that controls this type of hair loss has yet to be discovered (researchers have identified other genes that control less common hereditary types of hair loss).

The specific androgen, or male hormone, responsible for this type of hair loss is dihydroxytestosterone, or DHT, which is found in the scalp of all individuals with androgenetic alopecia. DHT has no effect on normal hair follicles but only on those hair follicles that are genetically predetermined to be susceptible; “normal” hair is immune and will continue to grow as described in the section above. Over time an affected hair follicle becomes weaker; its growing phase becomes shorter and shorter. Each hair shaft that emerges becomes finer and finer, and the color becomes lighter and lighter. *Miniaturization* is the term used for this process in which affected hairs become shorter, finer, and lighter with each growth cycle. Keep in mind that the hair just doesn’t fall out all at once, leaving the person suddenly bald—the process takes many years and is very gradual.

In androgenetic alopecia, the hair on the back and sides of the head is never lost, because this hair is genetically programmed to grow for a lifetime. The persistence of this rim of hair led doctors to wonder whether, if the only reason people lost hair on the top of the head was genetics, hair moved to the top of the scalp from elsewhere might take and thrive.

The first such “hair transplants” were performed in the late 1950s. They proved that these donor hairs would continue to grow when moved (transplanted) from the back or sides of the head to the bald areas on the scalp. These days there are several treatment options for common baldness.

MEDICAL TREATMENT

At the present time two drugs are approved by the FDA for the treatment of hair loss:

Finasteride (Propecia) is a prescription oral medication that specifically reduces the production of DHT by blocking the enzyme necessary for its formation. The pill, which is not approved for use in women, appears to be effective only in men: studies have shown that over 80 percent of men taking finasteride do not show evidence of further hair loss, and about two-thirds actually experience increased hair growth. The drug must be taken daily and, if stopped, the hair loss will eventually resume. Impotence is a possible side effect (in less than 2 percent of men), but it is completely reversible upon discontinuing the drug.

Minoxidil (Rogaine) is a topical solution that is applied to the scalp twice daily. It is sold over the counter in both 2 percent and 5 percent solutions—the latter strength is approved for use only by men. Minoxidil is effective in retarding hair loss and promoting hair growth. Like finasteride, if successful, it must be continued indefinitely. Side effects, which include itching or scaling of the scalp, are more common with the stronger solution.

Both minoxidil and finasteride are most successful in younger men who are just starting to lose their hair and are not completely bald. Both drugs treat the top of the head (crown) more effectively than the hairline (frontal). Minoxidil appears to be effective in treating frontal thinning in women and is particularly successful in menopausal women.

These drugs allow people who are losing their hair to take a proactive role in trying to prevent impending future hair loss. Nevertheless, it is still a losing battle for many people. More effective inhibitors of DHT will surely become available in the future.

Some dermatologists mix minoxidil with low concentrations of Retin-A and/or a low-strength steroid solution. Its additional benefit has not been proven, although I have seen some anecdotal improvement.

SURGICAL TREATMENT

Hair transplantation is now the most common cosmetic procedure performed on men. Originally invented by dermatologists, the technique has been refined from a relatively crude procedure to a highly sophisticated one that utilizes state-of-the-art microsurgical techniques. As mentioned, the procedure involves taking hair from the back and sides of the head, which is genetically programmed to grow for a lifetime, and moving it to the bald areas of the scalp where it continues to grow.

In the original method of hair transplantation, multiple hairs were removed from the back of the head in the form of small round cylinders called “plugs” and placed into round holes in the bald area, where the hairs would continue to grow. The procedure was done under local anesthesia. About fifty plugs per session were considered average, and it usually took four sessions to completely fill in an area and avoid a corn-row appearance. The bald areas treated could be adequately covered with hair, but the hairlines were aesthetically unacceptable, and people had to comb their hair over or forward to hide the evidence of the transplanted plugs.

In the past decade dermatologists have developed revolutionary techniques called micro- and minigrafting. The donor hair is divided up into

groups of one to two hairs (micrografts) or three to five hairs (minigrafts). With this new technology, hairlines can be created composed entirely of single hairs. Because of the naturalness of these small grafts, which don't look "pluggy," people have good results after just one procedure. Some men can even comb their hair straight back, completely exposing their transplanted hairline. It takes less time to achieve adequate density in bald areas, since as many as a thousand grafts can be transplanted in a single session.

Recent improvements in how the grafts are taken from the donor site have further enhanced the procedure. The donor hair is now separated under magnification into naturally occurring groups of one to three hairs, called follicular units, allowing the hair transplant surgeon to achieve results that are almost undistinguishable from a natural head of hair.

HOW HAIR TRANSPLANTATION IS DONE

Hair transplantation is done as an office procedure. Local anesthesia is used, so that the patient is awake and can watch TV, read, or listen to

CHOOSE YOUR TRANSPLANT SURGEON CAREFULLY

There are many doctors in different specialties who perform hair transplantation, a procedure developed and refined by dermatologists. This procedure is highly skill-dependent, so choose your doctor carefully. Follow these guidelines:

- Check credentials—is the doctor board certified in dermatology or another medical specialty known for transplantation?
- How many procedures does he or she do a week? (A doctor who does only a couple a month is unlikely to have refined the process for optimal results.)
- Does the doctor do the procedure himself or herself? It is customary to have nurses assist in preparing the graft.
- Are the fees reasonable, given the level of expertise? Fees that are too low should raise suspicion, as should fees that are too high.
- Although advertising is now common in the hair restoration field, be cautious about "franchised" hair transplant operations in which no specific doctor is identifiable as the surgeon.
- If your dermatologist doesn't perform hair transplants, ask for a referral.

music during the process which, in the hands of a skilled transplanter, takes just a few hours.

Risks are minimal, and the most serious problems occur when physicians are inexperienced. *It is important that prospective patients choose their transplant surgeon carefully*—in order to avoid common mistakes such as improper placement of the hairline, wasting donor hair, and damaging existing hair.

Before any surgery is scheduled, you should be able to speak personally to the operating physician so that your goals and desires are clearly understood. You need to carefully research the credentials of your doctor, and if necessary speak to people who have had the procedure done by this doctor. An informed patient will always have the best results.

OTHER PROCEDURES FOR BALDNESS

Other surgical procedures available to treat androgenetic alopecia can be done individually or can be combined with hair transplantation.

Alopecia reduction, also known as scalp reduction, is used most often with patients who have extensive baldness involving both the crown and frontal parts of the scalp. In these patients it would probably not be possible to cover the entire bald scalp using hair transplantation alone, mostly because the amount of available donor hair would be insufficient.

The scalp-reduction technique is used primarily on the crown, combined with hair transplantation in the front. The two to three square inches to be removed are carefully marked out on the scalp and the area is surgically excised. The skin on each side is then separated from the underlying tissue, so that it can be stretched across the open area and sewn together, thus spreading the existing hair over a wider area. There may be considerable discomfort following the surgery and narcotic pain relievers may be required. Complications include scarring, thinning of the scalp, and reappearance of the bald area. The advances in micrografting have led to a decrease in alopecia reduction procedures.

Complicated plastic surgery procedures are also sometimes used to treat common baldness. Flaps of hair-bearing scalp are taken from the back and sides of the head and brought forward to replace the bald areas in the front. These procedures are done by relatively few surgeons and require a high level of skill. There are extensive possible side effects and complications.

NONSURGICAL TREATMENT

People who prefer not to have surgery or who have extensive baldness and want a full head of hair may choose to wear a hairpiece. Made of artificial or human hair, hairpieces come in many styles, thicknesses, and colors. Most of these hair replacement systems need to be adjusted every one or two months or they get too loose; they usually last one or two years before having to be replaced. There are many different methods of anchoring the hairpiece to the scalp—including glue, tape, snaps, or even stitches sewn into the scalp—or it can be attached by weaving it into the existing hair.

Complications do occur from wearing hairpieces. If the hairpiece cannot be removed, many people experience itching or irritation of the scalp since it is difficult to properly cleanse the area. If the problem persists, the hairpiece may have to be removed. Hairpieces that are sewn to the scalp often cause infections that may require antibiotics and removal of the stitches. Allergic reactions to the glue and tape are not uncommon.

Many people do not like the feeling of having something artificial attached to their scalp or are concerned about the hairpiece being noticeable. Others wear hairpieces for years without difficulty. It is important to choose a reputable facility because techniques and costs vary widely.

▪ OTHER TYPES OF HAIR LOSS

SHEDDING OF RESTING HAIR

If you woke up one morning and noticed hair on your pillow, then took a shower and the drain clogged with your hair, not only would you definitely be having a bad hair day but you would also probably be experiencing *telogen effluvium*. Because effluvium means shedding and telogen is the resting phase of the hair growth cycle, telogen effluvium is the excessive shedding of resting hair. It is characterized by the sudden onset of hair loss in a previously normal scalp. The hair loss is characteristically diffuse and does not cause bald patches. Usually a considerable amount of hair—about 50 percent—can be shed before the hair loss becomes noticeable. There is no itching, burning, or redness of the scalp.

The cause of this episode can usually be determined by a careful history. After a precipitating event, such as a severe illness with a high fever, surgery under general anesthesia, or severe sudden emotional stress, the hair suddenly stops growing and goes into the resting phase. In this condi-

tion a significantly greater number of hairs convert into telogen phase than the normal 10 percent, with the resulting loss of hair.

The actual diagnosis of telogen effluvium is easy when one takes a look at the individual lost hairs. If you pull the shed hair slowly through your thumb and forefinger, you can feel a little knob at the end of the hair shaft; examined closely, this knob looks white.

Hair loss following pregnancy is a classic example of telogen effluvium. After being stimulated by the increased hormonal activity of pregnancy, the hair roots are suddenly shocked by the stress of delivery. The result is an extensive shutdown of the growing hair follicles, with subsequent loss of hair one to three months later.

Crash diets resulting in significant weight loss can deprive the hair follicles of nourishment (as in protein deficiency states) and trigger telogen effluvium. Many drugs can cause this type of hair loss, including anticoagulants (Coumadin), beta-blockers, (propranolol), and antidepressants (lithium).

There is no specific treatment for telogen effluvium, because the problem is of limited duration and the follicles will revert to normal. All of the lost hairs will regrow since there was never any damage to the hair follicle, merely an interruption in the normal hair cycle. In those cases of hair loss caused by chronic emotional stress, malnutrition due to excessive dieting, or the continued use of drugs, the underlying specific situation needs to be corrected before the hair loss will clear up.

SELF-INFLICTED HAIR LOSS

Most of us have twisted our hair around our finger while watching TV or reading. But some people do more than twist their hair; they actually pull their hair out, leaving patchy areas of baldness and broken hairs. Although this can just be a very bad habit, in others it is a sign of significant emotional disturbance. Self-inflicted hair loss caused by such turmoil is known as *trichotillomania*, and is more common in children than in adults.

When the child denies pulling hair out it is helpful to go on a vigil to try to confirm that this is actually happening. The type and extent of hair loss depends on the severity of the pulling and plucking of the hair. It may be localized to a few selected patches on the scalp, mimicking alopecia areata (see below), or it may involve extensive areas. There occasionally may be some localized redness or flaking on the scalp. In the absence of a confession from the person afflicted or from the parent, diagnosis is still

possible by studying the variation in the length of the remaining hairs in the affected areas. These sections can be completely bald if the hairs were recently pulled out, or there may be patches of very short hair as it regrows, but they are not long enough to be pulled out again.

The only treatment is to discuss the cause of the problem in detail, so that the person understands the nature of the hair loss and the fact that it could lead to permanent baldness. Psychiatric consultation might be necessary for some people.

WHEN STYLE AND HEALTHY HAIR COLLIDE

Have you ever worn your hair pulled back in a tight ponytail? Have you ever had your hair tightly woven in tiny braids? Either style may look attractive, but each can potentially inflict permanent damage to the hair roots. The constant pulling from tightly braided hair is a major cause of hair loss, particularly in African-American girls.

This type of hair loss is called *traction alopecia*. Typically, many children wear their hair in short tight braids, and as they get older they pull the braids back into a tight ponytail. As a result of this constant yanking on the hair roots, a particular pattern of hair loss begins to emerge. First the hair is lost in the temples, which can then extend to the front of the hairline. The hairs become shorter and finer, and after many years, a band of hair loss develops where the hairline should have been. This hair is so fine and short that the entire hairline area looks bald.

Traction alopecia can be caused by the constant use of tight rollers and can occur in any race. The process is gradual and takes years to fully develop. It is reversible, in the beginning, if hairstyles are changed. However, permanent hair loss can result after many years of constant physical stress to the hair roots. Many adolescent girls realize too late that their problem may be permanent.

ALOPECIA AREATA

Alopecia areata is a medical form of hair loss. It is a specific condition of follicles that usually occurs in several localized patches on the body or scalp and is limited in extent. In severe cases of alopecia areata, widespread hair loss may occur on the scalp (alopecia totalis). In those rare cases when all body hair is lost (alopecia universalis), the hair follicles that normally produce hair have become permanently dormant. It is said that

John D. Rockefeller suffered from alopecia. Rockefeller University, founded by him, conducts valuable dermatology research even today.

Alopecia areata occurs most often in children and is probably due to an immunologic reaction in the body to the hair follicle. In most cases of alopecia areata, hair growth begins again on its own within months of the first appearance of the bald patches. When this does not happen, there are treatments aimed at stimulating hair follicles to regenerate hair growth, but there are no guarantees. If hair loss is modest, corticosteroid may be injected into the bald patches or applied directly to the skin as a lotion to stimulate hair growth. Usually, hair begins to grow again within weeks, and the injections are repeated in about a month. Anthralin cream may also be applied to the hairless area; this irritant is used every day and rinsed off an hour later. The treatment usually stimulates hair growth within two to three months. Other treatments, designed to interfere with the offending immunologic reaction and involving other topical agents, promise some hope.

No treatments have proven effective in restoring hair growth when hair loss is total. If you are suffering from any variety of alopecia areata, you might want to contact the National Alopecia Areata Foundation (see Appendix 5).

SUDDEN HAIR LOSS

If hair loss is rapid or sudden, you should consult your doctor in order to rule out the possibility of internal disease, such as a thyroid condition, bowel disease, AIDS, or malnutrition due to anorexia nervosa. Insufficient protein from a vegetarian diet is another possible cause.

INFECTIONS AND DISEASES

Any rash or infection of the scalp can cause hair loss if it goes deep enough. The hair root itself sits in the fat below the upper layers of the skin and is generally not bothered by superficial irritation or inflammation of the scalp. There are diseases, however, that can strike the deeper layers of the skin and can cause scarring of the scalp with permanent damage to the hair root and subsequent loss of hair. Any severe bacterial or fungal infection of the scalp can potentially cause areas of baldness (see chapter 25).

Two specific diseases that can harm the scalp are lupus erythematosus and lichen planus. Lupus is a connective tissue disorder thought to be caused by antibodies that the body makes to its own tissues, so-called auto-antibodies. Lupus affects the scalp by causing inflammation around

the hair follicles, usually in patches, which results in scarring of the skin and permanent loss of the hair. An area of alopecia caused by lupus is initially red and scaly; once the hair loss occurs the skin turns thin and shiny.

Early treatment with topical corticosteroid cream and local injections of corticosteroid into the patches may be effective in stopping the progress of the disease. Drugs that may be used to control the disease systemically, such as anti-malaria drugs or oral corticosteroid, may also help stop the hair loss. However, once scarring has occurred no effective treatment is available for regrowing the hair.

Lichen planus is an uncommon skin disease that can also affect the nails and hair. We don't know what causes this rash, which consists of itchy, purple, flat-topped bumps on the wrists, trunk, legs, and occasionally the scalp. There are scattered patches of inflammation that result in irregular areas of hair loss, scalp skin is firm, pink to purple, and may have a fine scale. The openings of the hair follicles may be enlarged. The patches are usually small but may merge to form larger areas of baldness. Treatment, which is most effective in the early stages of inflammation, consists of topical, injected, or, if necessary, systemic corticosteroid. Once the hair is lost, the roots are destroyed and regrowth is not expected.

After many years of inactivity, the bald areas in both lupus and lichen planopilaris may be treated with hair transplantation.

▪ HIRSUTISM

Just as balding may plague a man, hirsutism, or abnormally abundant hair growth, can be the bane of a woman's existence. Hirsutism is triggered by androgens, the male hormones. It may occur when a woman has an increased sensitivity to the androgens that are always present in her system in small quantities or when elevated levels of androgens are present in the blood. The hair grows excessively in areas dependent on androgens for hair follicle stimulation, including the mustache, beard, and sideburn areas of the face as well as the chest and upper back. Because some ethnic groups tend to have more hair than others, a diagnosis of hirsutism is reserved for women who have more hair in comparison to their mothers and sisters.

There are many temporary remedies that deal with unwanted hair, such as bleaching, waxing, shaving, and chemically dissolving the hair. The only permanent solution is electrolysis, although there is a great deal of excitement now about laser hair removal (see p. 145). Although hair-

removal lasers do not permanently eliminate unwanted hair, they are rapid, relatively painless and effective at reducing the size of hairs, and thus its thickness. Laser hair removal is probably preferable to electrolysis for most people.

The purpose of electrolysis is to destroy each hair follicle so that it can't grow back. The best results are obtained if the follicle is zapped when it is in the active growth phase. Electrolysis is performed with a fine needle that is placed through the pore and gently advanced toward the hair bulb itself. Electric current, heat, or a combination of the two is used for a fraction of a second to permanently damage the complete hair unit. Electrolysis is a painstaking procedure that requires multiple visits making it less appealing than laser hair removal.

Women who undergo electrolysis sometimes complain about discomfort, so in areas that are especially sensitive, such as the upper lip, a topical anesthetic cream containing lidocaine can be helpful.

Electrolysis is not without potential side effects. It can worsen the appearance of broken blood vessels on the face and cause darkening of light skin, lightening of dark skin, or scarring. In the short term, some people get redness and some scabbing. The scars that might result are usually tiny circular areas of white that surround the pore where the needle has been placed.

▪ DANDRUFF

Dandruff is actually a low-grade form of seborrheic dermatitis (see p. 279). Symptoms include itching and scaling on the scalp, the evidence of which appears on clothing as flakes of dead skin. Dandruff is a more serious problem for some than for others, but it is a cosmetic problem rather than a real medical problem.

If you have dandruff, you should wash your hair daily. Proper washing will help to control your dandruff and cut down on outbreaks. Proper

BUBBLE HAIR

Bubble hair occurs from using excessively hot blow dryers or curling irons. The hair becomes brittle, and rows of tiny bubbles can be seen within the hair shaft under a microscope. The condition is completely reversible just by lowering the setting on your dryer.

shampooing will not dry out your hair or scalp and will slow the production and shedding of skin cells on the scalp that are responsible for those telltale white flakes on that beautiful black silk blouse or navy blazer. Many shampoos available over the counter contain an anti-dandruff ingredient, the most common of which is salicylic acid. Using an anti-dandruff shampoo controls most cases of dandruff. However, if your dandruff continues to be severe, you may want to consult your dermatologist, who can prescribe a stronger anti-dandruff shampoo, such as Nizoral, which has an antimicrobial ingredient. Tar shampoos are excellent for controlling dandruff as well—Neutrogena makes some excellent products such as T-gel Shampoo. Head and Shoulders Intensive Treatment is also very good.

▪ PERMS AND STRAIGHTENERS

Permanents, a.k.a. perms or permanent waves, add artificial curls and waves to the hair. The textures that result from the application of solutions in a permanent last longer than those obtained from setting hair with curlers. The active ingredient in these solutions is thioglycolate, an alkaline chemical that breaks sulfur bonds in the hair. After the hair is curled or straightened, another chemical is added to allow new sulfur bonds to form. The solution may be applied hot or cold. Cold lotions are considered safer than perms that depend on heat. The heat will not only singe hair but may also burn the scalp. If burning is severe, a rare occurrence, the price for your permanent may be permanent hair loss.

Sometimes these solutions may cause allergic reactions. If your hairstylist notices any scaling or redness when the lotion is applied, or if you notice persistent itching, you should forgo the rest of the permanent.

Hair straighteners are usually petroleum jelly-based and their effect is temporary. When these preparations get on facial skin, they can cause a specific kind of acne called pomade acne. Gums, paraffins, and waxes may also be used to straighten hair. A few hair-straightening agents depend on the same thioglycolate ingredients used in permanent wave solutions. These solutions can damage hair in the same ways that permanent wave solutions can.

▪ SUN AND HAIR

Too much ultraviolet light can turn healthy hair into dry, brittle, lusterless hair. Sun-damaged hair may even break when you comb or brush

it. While some hair products contain a sunscreen, this sunscreen cannot protect the keratin in your hair. In addition, it's hard to apply any hair product evenly to every hair shaft. The best way to protect your hair from sun damage is to wear a wide-brimmed hat when you are going to be outside. Color-treated hair is particularly susceptible to sun damage.

▪ HAIR CARE AND GROOMING

Here are some practical points about hair care:

- Don't shampoo excessively—once a day is fine.
- Avoid the excessive use of chemicals for conditioning (conditioners just coat the hair shaft).
- Avoid excessive exposure to the sun.
- Do not wear tight braids. Tight braids, especially in children, can result in a form of baldness called traction alopecia (see p. 159.)