

UDC 616.594.1

Sapianov Yevhenii

Hairdresser

TRICHOLOGY FOR HAIRDRESSERS: HAIR ANATOMY AND PHYSIOLOGY

Summary. *In the modern beauty industry, the profession of a hairdresser goes beyond simply creating hairstyles. Today, a hairdresser must not only master the technique of cutting and coloring, but also understand the structure and physiology of hair. Trichology, a science that studies the structure, growth and diseases of hair, is becoming an important part of the professional training of hairdressers.*

This article examines in detail the anatomical structure of hair, its chemical composition, growth phases and factors affecting its health. Particular attention is paid to why a hairdresser needs to understand the basics of trichology. This knowledge allows you to minimize damage during procedures, choose the right care and give clients scientifically based recommendations. The introduction of trichology into hairdressing practice improves the quality of services and strengthens customer trust.

Key words: *Trichology, hairdressers, hair anatomy, physiology.*

Introduction. A modern hairdresser is not just a performer, but an expert in the field of hair health. Clients increasingly expect not only an aesthetic transformation, but also the preservation of the hair structure after coloring, curling or heat styling. Without understanding the basics of trichology, a hairdresser will not

be able to correctly assess the condition of the client's hair and select gentle techniques.

Trichology helps a hairdresser explain why some procedures can harm, while others can restore hair. For example, knowledge of the structure of the cuticle allows you to understand how aggressive coloring destroys the protective layer, leading to dryness and brittleness. Awareness of the life cycle of hair helps to distinguish between natural hair loss and pathological alopecia.

In addition, clients increasingly turn to hairdressers with questions about proper care, hair nutrition and the selection of professional products. If the master cannot give a reasoned answer, trust in him decreases. Thus, trichology is not just an additional discipline, but a necessary condition for professional growth in the beauty industry.

Hair anatomy: structure and composition

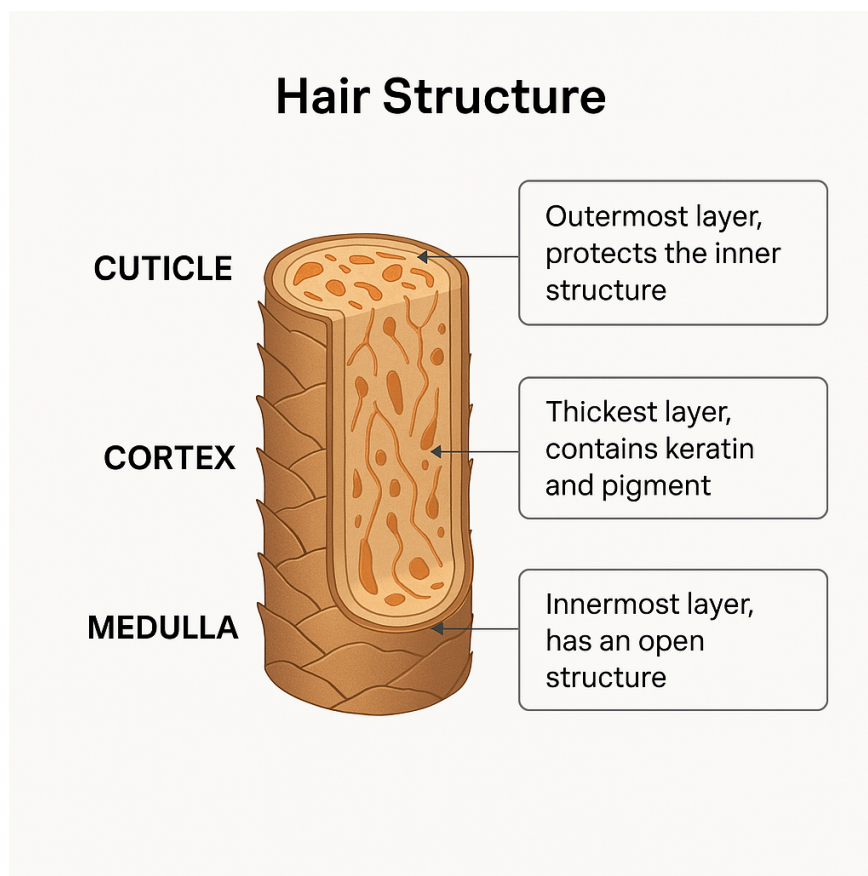
Hair is a complex structure consisting of two main parts: the visible shaft and the root hidden under the skin. The hair shaft is a dead tissue formed by keratin cells, but its condition directly depends on the health of the hair follicle.

The outer layer of the hair, the cuticle, consists of overlapping keratin scales that protect the inner layers from mechanical and chemical damage. When the cuticle is destroyed (for example, due to frequent use of curling irons or aggressive dyes), the hair becomes porous, loses its shine and breaks easily.

The middle layer, the cortex, makes up to 90% of the hair mass and is responsible for its strength, elasticity and color. It is in the cortex that the processes associated with perming and coloring occur. If the cortex is damaged, the hair loses elasticity, becomes lifeless and does not hold its shape well.

The medulla is the central layer, which is not present in all hair types. In fine hair, the medulla may be absent, while in coarse hair, it may be well-defined.

Although its exact function is not fully understood, it is believed to play a role in thermoregulation and nutrition of the hair.



Graph 1. Hair structure (a detailed diagram with all layers and their functions indicated).

Hair life cycle

Hair growth occurs cyclically and includes three main phases: anagen, catagen and telogen. Anagen is the period of active growth, which lasts from 2 to 6 years. During this phase, the cells of the hair follicle divide intensively, ensuring the lengthening of the hair.

Catagen is a short transitional phase, lasting about 2-3 weeks. During this period, hair growth slows down, the follicle contracts, and the hair gradually separates from the vessels that feed it.

Telogen is the resting phase, when the old hair falls out and a new one begins to form. Normally, about 10-15% of hair is in the telogen phase, and their daily loss (50-100 pieces) is a natural process.

Understanding these phases helps the hairdresser explain to the client why some hairs fall out and others continue to grow. If the client experiences increased hair loss, the hairdresser may recommend consulting a trichologist to rule out pathological causes, such as hormonal imbalances or nutritional deficiencies.

Chemical composition of hair

Hair is 80-85% keratin protein, which is formed from amino acids such as cysteine, serine and glutamic acid. Disulfide bonds (bridges between cysteine molecules) play a special role, giving hair strength. During perming or straightening, these bonds are broken and restored in a new position, which changes the structure of the hair. Water makes up 10-15% of hair and affects its elasticity. Without enough moisture, hair becomes dry and brittle, so it is important to use moisturizers, especially after heat treatment.

Lipids (fats) are part of the cuticle and intercellular cement, providing protection from external influences. If they are lacking, hair loses its smoothness, becomes dull and difficult to comb. Minerals such as zinc, iron and sulfur play a key role in the synthesis of keratin and maintaining healthy hair. Deficiencies in these elements can lead to slow growth, thinning and even alopecia.

The impact of external and internal factors on hair condition

External factors such as frequent coloring, heat styling, exposure to ultraviolet radiation and chlorinated water can seriously damage hair. For example, high temperatures destroy keratin, making hair porous, and UV rays oxidize the pigment, causing fading.

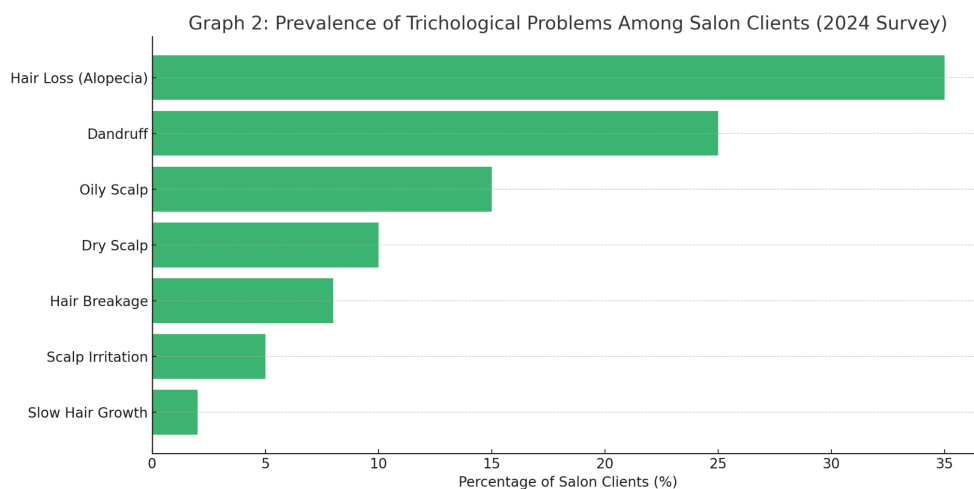
Internal factors include hormonal changes (for example, during pregnancy or menopause), stress, poor nutrition and chronic diseases. Deficiency of B vitamins, iron and protein directly affects hair growth and quality.

A hairdresser who knows trichology can recommend not only professional care to the client, but also lifestyle changes, such as including foods rich in omega-3 in the diet or taking vitamin complexes.

Main trichological problems and their causes

Dryness and brittleness of hair are most often associated with damage to the cuticle. This occurs due to frequent use of a hair dryer, irons or chemical procedures. The protective layer can be restored with keratin masks and serums with silicones (temporary) or protein complexes (long-term).

Oily hair is caused by hyperfunction of the sebaceous glands. This can be a genetic feature or a consequence of hormonal imbalance. For correction, mild cleansing shampoos with zinc and salicylic acid are used.



Graph 2. Prevalence of trichological problems among salon clients (according to a 2024 survey)

Alopecia (hair loss) has many causes: from stress and vitamin deficiency to autoimmune diseases. If a client complains of severe hair loss, a hairdresser should recommend a consultation with a trichologist and hormone tests.

The Importance of pH in Hair Care

The acid-alkaline balance (pH) plays a fundamental role in the health of the hair and scalp. The optimal pH level for hair is 4.5-5.5, which is slightly acidic. This pH keeps the cuticle closed, providing smoothness, shine and protection of the inner layers.

Most professional procedures, such as coloring, perming or lightening, use alkaline formulations with a pH of 9-11. They lift the cuticle scales so that the active components penetrate the cortex. However, if the acid balance is not restored after the procedure, the hair remains porous, which leads to dryness, brittleness and rapid color fading.

A hairdresser must understand how acidic and alkaline products work:

Alkaline products (permanent dyes, perming formulations) require the subsequent use of acidic balms (pH 3-4), which seal the cuticle.

Sulfate shampoos have a high pH (up to 8), so their frequent use disrupts the hydrolipid barrier. An alternative is sulfate-free formulas with a neutral pH.

Acid rinses (apple cider vinegar, lemon water) help restore balance, but should be used in doses so as not to dry out the hair.

For clients with sensitive scalp or a tendency to irritation, it is especially important to choose products with a physiological pH. For example, with seborrheic dermatitis, alkaline shampoos can aggravate the problem, while mild cleansing products with a pH of 5.5 reduce itching and flaking.

Practical application of trichology in hairdressing

A modern hairdresser who knows the basics of trichology is no longer just a performer and becomes a true expert in hair health. This knowledge is used in every aspect of the work - from diagnostics to the selection of care. Before any serious procedure, a professional conducts a thorough analysis of the condition of the hair and scalp, assessing their elasticity, porosity and the degree of damage. When dyeing, trichological knowledge helps to correctly select the concentration of the oxidizer, use gentle techniques and recommend optimal intervals between procedures. When working with chemical curls and straightening, understanding the structure of the hair allows you to avoid excessive damage to disulfide bonds. Even when cutting and styling, a master who understands trichology selects tools and techniques that match the type and condition of the hair. Of particular importance is the ability of a hairdresser to give clients competent recommendations for home care - from the selection of professional lines to nutritional advice for strengthening hair. In complex cases, when signs of alopecia, seborrhea or other trichological problems are detected, an educated master will not experiment, but will competently refer the client to a trichologist.

Hairdresser training in the basics of trichology

Today, high-quality hairdressing education is impossible without a deep study of trichology. The basic course should include not only the anatomy and physiology of hair, but also the basics of its biochemistry, diagnostic principles, and the difference between cosmetic and medical problems. Modern training formats combine traditional lectures with interactive master classes, where real examples are used to discuss different types of hair and methods of working with them. Of particular value are workshops on the use of diagnostic equipment - trichoscopes and microscopes, which allow you to study in detail the condition of the hair and scalp. Leading educational centers are already introducing VR technologies, creating

virtual simulators for practicing diagnostic skills. No less important is the system of certification and continuous education - professional associations are developing knowledge standards, advanced training programs and registers of certified specialists. Regular participation in conferences, studying professional literature and sharing experience with colleagues are becoming mandatory elements of growth for a modern master.

Conclusion. Trichology has revolutionized the concept of the hairdresser's profession, turning it from a craft into a science of hair health. Today, a hairdresser who does not possess this knowledge cannot be considered a true professional. Understanding the structure and physiology of hair allows you not only to perform procedures, but to do so taking into account their long-term impact on the condition of the hair. For clients, this means not only an aesthetic result, but also maintaining the health of hair after dyeing, curling or other manipulations. The beauty industry as a whole benefits from this approach - the professional level increases, the amount of damaged hair decreases, and trust between hairdressers and clients is strengthened. The future of hairdressing is seen in even closer integration with medical knowledge, the emergence of new specializations and the development of hardware diagnostics directly in salons. Mastering trichology is not just following a trend, but a necessary condition for those who want to remain a sought-after specialist in the rapidly developing beauty industry.

References

1. Robbins, C.R. (2012). Chemical and Physical Behavior of Human Hair. 5th ed. Springer.
2. Bouillon, C. & Wilkinson, J. (2005). The Science of Hair Care.
3. Tobin, D.J. (2017). Hair in Toxicology: An Important Biomarker.
4. Trüeb, R.M. (2020). Hair Growth and Disorders. Springer.

5. Draelos, Z.D. (2015). Hair Care: An Illustrated Dermatologic Handbook.
- Gavazzoni Dias, M.F. (2015). "Hair cosmetics: An overview."