



## HAIR

Many individuals want to protect or enhance their appearance to ensure it is presentable to the world; however, an individual's good intentions sometimes have negative consequences. Such can occur after the application of some hair care products and daily hair care procedures that inflict damage on the hair fiber. Unintentional hair loss may be devastating, as hair often plays a great role in the social construct of human society and can lead to increased depression and anxiety.

Some forms of hair loss are insidious and are the result of cosmetic products or chemical and physical damage. This may lead to fragile hair, breakage and loss. Such products or procedures are:

- Chemical treatments
  - Coloring agents
  - Permanent waves
  - Relaxers
- Daily hair care practices
  - Blow drying
  - Hot curling
  - Flat ironing
  - Hair sprays
  - Hair gels
  - Hair mousses
  - "Natural" products

Chemical treatments include coloring agents for the hair, permanent waves, and relaxers. Coloring agents alter the hair color for beauty enhancement. Individuals who want a permanent curl of the hair, while relaxers provide permanent hair straightening use permanent waves.

The most damaging coloring agents are the permanent colors. They involve the use of ammonium and hydrogen peroxide, combined with a dye to deposit color permanently in the cortex of the hair shaft. During this process, the hair's natural color is removed, resulting in destruction of the hair's foundation, keratin proteins. Permanent color or highlighting must be done again on the hair roots, as it grows to maintain the enhanced look. This should be completed every 2-4 months, based upon the rate of hair growth. The goal is to treat hair not previously treated, as overlapping permanent color may lead to damage of the hair cuticle, the outer protective coating of the hair. Once the hair cuticle and cortex is permanently damaged, trichorrhexis nodosa can occur and result in hair breakage.

Permanent waves contain thioglycolates. Once applied, they break the hair's disulfide bonds and weaken the hair. Disulfide bonds in relaxers are broken with the use of sodium hydroxide or guanidine hydroxide. Side effects of thioglycolates can include contact dermatitis; rarely, asthma has been reported. Complications from relaxers may comprise mild burns to the scalp and neck. Trichorrhexis nodosa may occur from use of either permanent waves or relaxers. Breakage with permanent waves may occur from the repeated damage to the entire hair shaft with each repeated application. Hair breakage from relaxers can be decreased by expanding the time periods between reapplication of relaxers (at least every 6-8 weeks). Importantly, relaxers have been associated with central centrifugal cicatricial alopecia, a form of permanent scarring hair loss, in women of color.

Daily hair care practices, such as blow drying, hot curling, flat ironing, or use of hair grooming products, may also damage the hair and many times leads to trichorrhexis nodosa. Repeated application of high temperatures to the hair shaft may increase the porosity of the hair causing damage to the cuticle and cortex. With the outer barrier damaged, the hair shaft easily swells with water from washing. Thus, the hair shaft weakens during repetitive washing and breaks easily.

Alcohol can be very drying to the hair. This may damage the cuticle that is then susceptible to breakage. Both hair sprays and some styling gels typically contain alcohol. Mousses have been associated with pomade acne, especially if they build up along the frontal hairline. Acne can be avoided by using products comprised primarily of humectants, such as glycerin, propylene glycol, and panthenol.

Some individuals use "natural" hair care products, which can have the adverse effect of irritant or allergic contact dermatitis. Aloe, cucumber, rosemary, sage, and tea tree oil have all been associated with contact dermatitis. Natural fragrances in hair care products have also been linked with contact dermatitis. These may include jasmine absolute, ylang-ylang, narcissus absolute, sandalwood absolute, and spearmint oil. Dermatitis, caused by allergens or irritants, can lead to great discomfort, may be cosmetically displeasing, and can induce hair loss. Treatment consists of oral and/or topical steroids, as well as avoidance of the allergen. Patch testing can be completed to determine, if the hair care product being used is causing a contact allergy.

The first step in treatment for damaged hair, such as with trichorrhexis nodosa, is to stop the offending agent. Recovery from this condition involves the use of moisturizing conditioners that coat the hair and assist in reducing the porosity of the cuticle. Sometimes, the damage is so severe the only treatment is cutting the damaged hair. Cutting of the hair may be necessary, especially, if the ends are splitting, as they will continue to split to the base of the hair shaft. At that point, the hair shaft will not be salvageable. Once the hair breakage is controlled, previous hair care practices may be reintroduced with caution or avoided completely.

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