



# Dyeing Hair is Dire or Desire

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## Abstract

**Background:** Hair coloring, or hair coloring, is the follow of fixing the hair color. The most reasons for this area unit cosmetic: to hide gray or white hair, to alter to a color thought to be additional modern or fascinating, or to revive the initial hair color once, it's been stained by hairdressing process or sun bleaching. Hair coloring is often done professionally by a stylist or severally reception. Celtic folks colored their hair blonde; they bleach it by laundry them in lime and brushing it back from their foreheads. The coloring of hair is associate ancient art that involves treatment of the hair with varied chemical compounds. In history, the dyes were obtained from plants. The event of artificial dyes for hair is derived from the legendary discovery of the reactivity of para-phenylenediamine (PPD) with air. **Results:** Hair dyes are cosmetic compounds that make contact with the skin throughout application. As a result of this skin contact, there exists some health risk related to use of hair dyes. People allergic to protein as an example, can have to be compelled to take care once buying hair color since bound dye includes protein. Protein doesn't have to be compelled to be eaten for it to cause associate hypersensitivity reaction. Skin contact with protein might cause a reaction; thus, resulting in associate hypersensitivity reaction. Symptoms of those reactions will embody redness, sores, itching, burning sensation, and discomfort. Symptoms can typically not be apparent instantly following the appliance and process of the tint, however may arise once hours or maybe daily later. **Conclusion:** Pigments of the hair got colored by the tactic of removing, replacing, or covering up. Employment of those chemicals may cause varied adverse effects, at the facet of temporary skin irritation and hypersensitivity, hair breakage, skin discoloration, and explosive hair color results. The ultimate color of every strand of hair can depend upon its original color and body. As a result of hair's color and body across the pinnacle and on the length of a hair strand, there'll be delicate variations in shade across the complete head. This provides an additional natural-looking result than the solid, everywhere color of a permanent color. Thus, hair dyes area unit regulated within the industrial marketplace and, as new toxicity knowledge is generated for a few hair dye, and health risks area unit discovered, in a controlled people, employment of hair coloring may end up in aversions and/or skin irritation.

**Keywords:** Oxidizing agents, Couplers, p-phenylenediamine, are permanent dyes, half-permanent dyes, semi-permanent dyes, and temporary dyes, and Alternative hair Dyes.

Hair coloring, or hair dyeing, is the carry out of shifting the hair color which is being practiced by adults in their In self-insight hair plays a significant role. In self-insight hair plays a significant role. To create a variety of styles its length, contour, surface, and color can be altered. The main motive for this is to cover the gray or white hair, but nowadays color considers as more trendy or popular. To cope up with hair dye demand there is an assortment of compounds existing in the market for hair coloring. Hair coloring is very well-liked nowadays and can be done a hairdresser or at home. Hair coloring is currently a multibillion-dollar trade that involves the utilization of each plant-derived and artificial dyes [1].

## History

Diodorus Siculus, a Greek scholar, represented very well however Celtic individuals colored their hair blonde. The coloring of hair is an ancient art that involves the treatment of the hair with numerous chemical compounds. In history, the dyes were obtained from plants. A number of the foremost documented are henna (*Lawsonia inermis*), turmeric, indigo, amla, and senna [2]. Others embody the

genus *Buxus dioica*, red ochre, black walnut, and leeks [3]. The event of artificial dyes for hair is derived from the decennary discovery of the reactivity of para-phenylenediamine (PPD) with air [4]. Eugène Schueller, the founding father of L'Oréal, is recognized for making the primary artificial hair coloring in 1907 [5]. In 1947 the German cosmetics firm Schwarzkopf launched the primary home color product, "Poly Color" [6].

## Dye, what is a Dye?

Dyes are chemical compounds having a size less than  $.01\mu\text{m}$  and that are soluble in the water or organic solvent. More than 200 substances are used in hair dyes nowadays. These dyes are classified as oxidative and non-oxidative dyes. Semi-permanent and temporary dyes are non-oxidative, in this the chemical agent used get deposited on the hair shaft and stain the color and permanent dyes are oxidative in this the chemical agent used taken up by the hair and inside form larger molecules that entrapped inside.

## Hair Dye Chemistry

Permanent hair coloring needs 3 items: (1) one, 4-diaminobenzene (historically) or two,5-diaminotoluene (currently), (2) a coupling agent, Associate in Nursing (3) an oxidizer. The method is often performed underneath basic conditions. The mechanism of reaction dyes involves 3 steps:<sup>[7]</sup> a) reaction of 1,4-diaminobenzene by-product to the compound state. b) The reaction of this diimine with a coupling compound, c) Reaction of the ensuing compound to relinquish the ultimate dye.

Various intermediate combos and chemical combinations offer souvenir hair colors. The first intermediates are aromatic para compounds, such as 1,4-diaminobenzene or 4-aminophenol. The coupling compounds (couplers) are meta-substituted derivatives of aniline oil. They are available in 3 main sections to support the color that emerges once they have responded to the first medium.

The preparation (dye precursors) is within the color range. **Oxidizing agents** are sometimes oxide, so alkaline setting is usually provided by ammonia. The combination of oxide and ammonia causes natural hair to lighten, provided the fabric with dye. Ammonia opens the hair follicles so that the dye spreads through the fiber. These dye blends and blending compounds will carry the reaction and blending of the blends as shown within the base below to make a great product, which is repaired within the hair matrix and cannot be quickly removed by washing.

**Couplers** are chemical compounds that outline the color of the dye. Shown here are 3 red couplers (A, B, C), 2 chromatic couplers (D, E), and a blue coupling (F). Blue couplers embody one, 3-diaminobenzene, and its derivatives. Red couplers embody phenols and naphthols, resembling 3-aminophenol (CAS#591-27-5), 5-amino-2-methyl phenol (CAS#2835-95-2) and 1-naphthol (CAS#90-15-3). The mix of two,5-diaminotoluene with the coupling 3-aminophenol provides a magenta-brown dye, whereas the mix of two, 5-diaminotoluene with the coupling 1-naphthol provides a purple dye.

Chromatic couplers contain phenol, 4-chlororesorcinol, and benzodioxoles. These compounds turn out broad-band absorption once they react to make dyes, granting a lot of natural-looking hair colors. The mix of two, 5-diaminotoluene with the coupling phenol provides a greenish-brown dye.

The first step shows the reaction of p-phenylenediamine to the quinone-diimine (C<sub>6</sub>H<sub>4</sub>(NH)<sub>2</sub>). This species exists in equilibrium with the monoprotonated type (C<sub>6</sub>H<sub>4</sub>(NH)(NH<sub>2</sub>)<sup>+</sup>).

The second step is termed as electrophilic aromatic substitution involves the hit of this quinone-diimine on the coupling.

In the third and final step, the merchandise from the quinone-diimine coupler reaction oxidizes to the ultimate dye.

It has long been believed that dye builds inside bonds that are higher than the reaction to fine hair<sup>[7]</sup>. It was later shown that the most reason that this reaction imparts a permanent color on hair by manufacturing larger dye molecules, that is secured within the hair<sup>[8]</sup>.

The four most common classifications are permanent dyes, half-permanent dyes, semi-permanent dyes, and temporary dyes.

## Permanent Dyes

Permanent hair color usually contains ammonia and should be mixed with a developer or oxidizer for good amendment hair color. Ammonia is employed in permanent hair color to open the cuticle layer so that the developer and colorants along will penetrate the cortex<sup>[9]</sup>. The upper the developer volume, the upper the "lift" is

going to be of an individual's natural hair pigment. Somebody with dark hair desire to attain 2 or 3 shades lighter might have the next developer whereas someone with lighter hair wishing to achieve darker hair won't need one as high. Temporal order could vary with permanent hair coloring however is often half-hour or forty-five minutes for those desires to attain most color amendment.

## Half-permanent Dyes

Is hair color that contains a base-forming agent however ammonia and, whereas perpetually used with a developer, the concentration of oxide in this developer could also be not up to used with permanent hair color. Since the base-forming agents used in half-permanent colors are less effective in removing the natural pigment of hair than ammonia these products give no lightening of hair's color throughout coloring. As a result, they cannot color hair to a lighter shade than it was before coloring and are less damaging to hair than their permanent counterpart.

Half-permanents are far more effective at covering grey hair than semi-permanent however less thus than permanents.

Half-permanents have many benefits as compared with permanent color. as a result of theirs primarily no lifting (i.e., removal) of natural hair color, the ultimate color is a smaller amount uniform/homogeneous than a permanent and so a lot of natural-looking; they're gentler on hair and therefore safer, particularly for broken hair; and that they wash out over time (typically twenty to twenty-eight shampoos), thus root re-growth is a smaller amount noticeable and if an amendment of color is desired, it's easier to realize. Half-permanent hair colors don't seem to be permanent however the darker shades, above all, might persist longer than indicated on the packet.

## Semi-permanent Dyes

Semi-permanent hair color uses compounds of lower mass than are found in temporary hair color dyes. These dyes penetrate the hair shaft solely partly, owing to the reduced quantity of developer used. For this reason, the color can survive recurrent laundry, usually 4-5 shampoos or some weeks. Semi-permanents should contain the suspected matter p-phenylenediamine (PPD) or alternative connected colorants<sup>[10]</sup>.

Hair color includes very little or no makeup, peroxide or ammonia, and it do little damage to the hair follicles. The reduced number of developers, whether peroxide or ammonia, or ammonia, means that hair that is inexplicably broken through permanent coloring or permanent restructuring is undoubtedly the least amount of damage to the entire dyeing process.

The final color of every strand of hair can rely upon its original color and body. As a result of hair's color and body across the pinnacle and on the length of a hair strand, there'll be delicate variations in shade across the complete head. This provides a lot of natural-looking results than the color of a permanent color.

As a result of grey or white hairs have a special beginning color than alternative hair, they're going to not seem because the same shade as the remainder of the hair once treated with semi-permanent color.

## Temporary Dyes

This is accessible in varied forms together with rinses, shampoos, sprays, and foams. Temporary hair color is usually brighter and a lot of vivacious than other hair color types. It's most frequently

won't to color hair for special occasions adore costume parties and day.

The pigments in temporary hair color are very large and cannot penetrate the cuticle layer. The color particles are constantly absorbed (very attached) to the surface of the hair follicle and removed with just one shampoo. Temporary hair color will persist on hair that's to a fault dry or broken in an exceedingly approach that permits for migration of the pigment to the inside of the hair shaft.

## **Naturally occurring auriferous Dyes**

Metallic dyes love salts of lead, bismuth, copper, cobalt, and silver offered in liquid kind. Once applied the particles act with organic compounds inside the cuticle to make a metal compound that slowly accumulates on the hair shaft, step by step dynamic the hair color from gray to black-brown.

## **Alternative hair Dyes**

Accustomed produce hair colors those not generally found in nature. These also are remarked as "vivid colors" within the hairstyling business. The on the market colors are numerous, comparable to the colors inexperienced, blue, and fuchsia. alternatives are on the market in some colors. Additionally recently, UV-light-reactive hair dyes are dropped at the market that fluoresces beneath UV-lights, comparable to those usually used at nightclubs. Some different colors, comparable to blue and purple, are semi-permanent and will take many months to completely wash the color.

They contain solely tint and don't have any developer. this implies that they're going to solely produce a bright color if they're applied to lightweight blond hair. bleaching is needed at the start of dark hair. bleaching of some hair sorts before might facilitate to hair to induce vivid colors.

## **Limitations**

Pigments of the hair got colored by the method of removing, replacing, or covering up. The use of these chemicals might lead to varying adverse effects, at the side of temporary skin irritation and hypersensitivity, hair breakage, skin discoloration, and explosive hair color results. in keeping with the International Agency for Analysis on Cancer (IARC), in vitro, and in vivo studies (in exposed human populations) have shown that some hair dyes and many chemicals used within the hair coloring methodology are also thought of agent and malignant growth malady<sup>[11,12]</sup>.

In permanent hair, dyes color is permanent and remains until the hair grows out. A touch-up of the roots mat is required once six to eight weeks wishing on the speed of growth. In touch-up ought to treat roots only as a result of the shaft color may darken to reapplication.

## **The semi-permanent dyes can cause skin problems.**

Temporary dyes are merely washed off with shampooing. Longer lasting results are also obtained if the hair is antecedent chemically treated or to a fault dry and damages, as this permits the migration of the pigment into the hair shaft.

Natural dye like henna has low allergic potential, and most cases of allergies are thanks to additives appreciate PPD, diaminobenzenes, etc. different limitations of such natural agent is

that the restricted color varies and it's robust to predict intensity that several times result in orange-red color hairs.

## **Application methods**

Wash your hair twenty-four to forty-eight hours before coloring. Doing this permits the natural oils in your hair. The dye can mix naturally together with your hair oil, which tends to form it last longer<sup>[13]</sup>.

If attainable, avoid conditioner after you wash your hair the day before coloring it.

Pick a color that you just adore. It's straightforward to urge engulfed by the many shades you'll be able to choose from. If this can be your initial time coloring your hair, its best to stay to a dyestuff that's no over 2 shades darker or lighter than your natural hair color<sup>[14]</sup>.

If you're unaccustomed coloring, you'll be able to conjointly attempt coloring your hair with a brief or semi-permanent dye initial. Exploitation one amongst these forms of dyes makes sure that if you smash, you won't have to support your mistake for long. Detain mind that you just ought to apply semi-permanent dye to damp hair.

Temporary dyes, appreciate chalk and mousse, typically wash out when one to a pair of shampoos. Semi-permanent dyes can rinse out when twenty to twenty-six shampoos. Permanent dyes are permanent. The color could fade when 6-8 weeks, however, can have to be compelled to grow out<sup>[15]</sup>.

Protect your home and yourself from dye stains. Whereas you would like to stain your hair, you are doing not wish weird blotches of redness everywhere your carpet and favorite shirt. Cowl any surface around you which may get dye on that and place newspapers on the ground. Have paper towels close to cope with spills. Wear a worn recent shirt you are doing not like, ideally one you're able to throw away.

Use towel or cape around your shoulders that will catch any dye that will drip off of your hair throughout the coloring method.

Brush your hair well. Ensure that there are not any tangles left in your hair. This step can build applying the dye easier

Coat your hairline, ears, and neck with Vaseline, balm, or the conditioner before applying dye to your hair. Put on your gloves. Gloves usually go with a dye kit, however, if they don't, you'll be able to merely use traditional rubber, vinyl, or latex gloves. Bear in mind that it's imperative to wear gloves once coloring your hair. If you are doing not, you'll find yourself coloring your hands besides<sup>[16]</sup>.

Use a container prepared to mix the dye. Follow the directions given in the box. Many of the boxes contain a container that you use just to mix the dye. Follow the instructions for mixing the dye ingredients in the bottle provided. Mix well to combined the ingredients. If your dye is not stored, you will be forced to buy a container for dyeing. Use an applicator bottle or brush to remove the dye from your hair. Use your molded fingers to find the dye on your hair<sup>[17]</sup>.

For virgin (first time) dyeing hair, begin applying dye 1 inch from your roots. For touch-ups, begin applying dye regarding ½ inch from your roots. Work the dye into your hair well so that you are doing over merely color the highest layer of your hair. Wipe excess dye off of your neck and forehead with a towel or wet fabric.

After some time is up, either get into the shower or use a sink to rinse your hair out. Use heat water to rinse the dye out of your hair. Rinse your hair till the water runs clear<sup>[18]</sup>.

Wait a minimum of an associate hour before shampooing your hair. This permits the dye to a lot of completely penetrates your hair shaft. You can blow dry your hair or dry it. All calculation methods can be used with any type of color. For lightening, the hair should usually be bleached before color.

Hair with highlights- Hair color was historically applied to the hair mutually overall color. The fashionable trend is to use many colors to provide streaks or gradations, however not all work on high of one base color. These are mentioned as:

**Light:** wherever sections of hair are treated with lighteners.

**Low lighting:** wherever sections of hair are treated with darker hair colors.

**Splash lighting:** a horizontal band of bleached hair, from ear to ear.

There also are newer coloring techniques corresponding to ombré, shatush, airtouch, during which hair is dark on the crown and bit by bit becomes lighter toward the ends.

**These are being applied by the subsequent methods:**

**Foiling:** wherever items of foil or wrap, this ensures the color is applied solely to the specified strands of hair and protects the strands of hair not supposed to be colored.

**Cap:** once a plastic cap is placed tightly on the pinnacle and strands are forced through with a hook.

**Dipping:** the color is painted directly on the hair. This ends up in a lot of solid levels of coverage on the ends of the hair <sup>[19]</sup>.

Hair coloring also can be applied on the scalp for a lot of solid level of coverage

**Root touch-up:** wherever color is applied hair nearest the scalp, recent section of re-growth. Root touch-ups are recurrent each 4–6 weeks because the natural color grows in and becomes apparent. Those who color their hair to disguise grey usually have these root touch-ups.

**All-over color:** wherever the person wants all of their hair to be a special solid color.

**Block coloring:** wherever the person needs 2 or a lot of colors applied to their hair, chiefly for dimension and distinction.

The safest thanks to color your hair would be to allow up permanent hair dyes and switch to natural hair coloring alternatives.

## Adverse effects

### Over method

Permanent hair colors sometimes contain ammonia (or chemicals virtually like it) and peroxide <sup>[20]</sup>. The ammonia breaks through your hair shaft, and so the peroxide neutralizes (or bleaches out) the natural pigment in your hair, removal away color. This methodology of relaxing the hair cuticles to reach the cortex of your hair and decolorizes its natural pigment is, primarily, hair injury.

Over treating your hair with these chemicals will cause it to lose luster, break merely, and in some extreme cases, wash away with water. Whereas processed hair is revived to a certain extent

with hair care treatments, the only real due to obtaining obviate the injury from over-processing is to chop your hair off.

## Skin irritation and hypersensitivity reaction

Inbound folks, the utilization of hair coloring might lead to allergies and/or skin irritation. folks allergic to macromolecule as an example, have to be compelled to use caution once shopping for hair color since certain hair coloring includes macromolecule. macromolecule ought to not be consumed for it to cause hypersensitivity. Skin contact with macromolecule may cause a reaction; thus, leading to hypersensitivity. Symptoms of this reaction can include redness, sores, itching, burning sensation and discomfort. Symptoms usually do not appear immediately following the application and touch method, but may also appear once hours or even days later.

To help stop or limit allergies, the majority of hair color merchandise recommends that the buyer conduct a diagnostic assay before practice the merchandise. This involves combining a small low quantity of tint preparation Associate in Nursing applying it on to the skin for several cardinal hours. If irritation develops, manufacturers recommend that the buyer not use the merchandise.

European dermatologists have, however, powerfully instructed against such pre-use testing, as a result of it entails additional sensitization (allergy) risk and so the interpretation by the lay of us may not be sufficient correct <sup>[21]</sup>.

## Effects on Fertility

Research is inconsistent during this regard. Although several studies state that there's lowest general absorption of hair products, hair dyes might not affect fertility or gestation. However, since they show a potential risk of being exposed to hair dyes for prolonged periods, it's higher to avoid hair dyes if you're trying to conceive or are pregnant

## Redness

Failing to exercise extreme caution once coloring your hair may result in the chemicals creating contact with the sensitive components of your face. In some cases, once chemicals from hair dyes build contact together with your eyes, it will cause redness or pink eye <sup>[22]</sup>. In different cases, it causes inflammation and severe discomfort.

## Asthma

Asthma is one of the symptoms of a severe aversion to hair dyes <sup>[23]</sup>. Continued inhalation of the chemicals in hair dyes will cause coughing, wheezing, respiratory organ inflammation, throat discomfort, and asthma attack attacks.

## Cancer

When permanent hair dyes were initially introduced, that they had compounds that were cancer (cancer-causing.) whereas the formulas were altered to interchange these chemicals, the talk on whether or not hair dyes will cause cancer has not been placing to rest <sup>[7]</sup>. On the contrary, a lot of research projects and studies are required to determine an explicit link between the employment of permanent hair coloring and cancer.

The salt ethanoate (the active ingredient in the gradual darkening product like Balkan country formula) is harmful <sup>[24,25,26]</sup>.

ethanoate trihydrate has conjointly been shown to cause reproductive toxicity [27].

Some articles link the event of some kinds of cancer with the use of hair color including cancer of the blood, non-Hodgkin's cancer, bladder cancer, blood cancer, and multiple myeloma [28,29]. Additional specifically, prolonged use of permanent dark hair dyes [30,31]. In 2004 a better-known human carcinogen substance 4-ABP, was found in some industrial hair dyes.

PPD-Phenylenediamine is understood to cause health issues, like skin irritation. Exposure to phenylenediamine will occur throughout producing or during the employment of hair dyes. Para-Phenylenediamine (PPD) is labeled as harmful and may cause adverse effects on aquatic organisms and will cause semipermanent effects in aquatic environments [32].

## Skin staining

Skin and fingernails are made from an analogous variety of keratinized tissue as hair. Dye that drips, slips on skin or hair result in discoloration, patches of stained skin, and additional hair tint around the hairline. That's why it's suggested that latex or organic compound gloves be worn to guard the hands.

This discoloration can disappear because the skin naturally renews itself and therefore the prime layer of skin is removed. To avoid skin discoloration, wear latex or organic compound gloves to guard the hands and conjointly by applying a skinny layer of petrolatum or oil-based preparation around the hairline. Mild abrasives like wet sodium bicarbonate or a tiny low quantity of toothpaste applied. Enamel remover doesn't seem to be thought of effective; detergent might generally work [33].

## Fortuitous results

Several factors influence the ultimate color of the hair following the coloring method.

For semi-permanent and half-permanent colors, the ultimate color could be a mix of the natural color of the hair and therefore the dye color.

Previous use of shampoos that deposit a layer of plastic on the hair will block the action of the dye.

Antecedently color-treated hair will react erratically with instant color treatments.

Bleached hair can usually need pre-pigmentation before a color application. Coloring bleached hair brown may result in gray or achromatic (grey sheen) hair.

If water has the presence of minerals, salts, chemical elements or alternative contaminants also affect coloring.

Coloring dark hair to realize a fascinating shade of blond needs bleaching, followed by secondary color treatment. Bleached hair will still have a yellow or copper-colored shade. A violet-based color will do away with yellow tones, and a blue-based shade can do away with copper-colored orange.

Consistency of hair will affect the ultimate shade. Porous hair usually absorbs additional color, which generally results in darker than expected.

## Natural Alternatives

While these ways would possibly solely offer you refined results, they're a good different to permanent hair dyes and can provide your hair a much-needed break.

### 1. Coffee/Tea

Freshly brewed occasional or tea will considerably darken light-weight hair [34]. All you wish to try to do is pour the brew through your hair as a final rinse and let it dry. The colour can wash out subsequent time you shampoo your hair, however, you'll simply repeat the method because it has no facet effects. Some teas will improve the health and texture of your hair.

### 2. Food Color

Food color and pigmented seasoned drinks like Kool-aid will be accustomed to attain an entire vary of crazy colors. Combine the food coloring or Kool-aid with conditioner and apply it to your hair. Let it sit for a handful of hours then rinse it out with water. It's safer to use natural dyes, like beets, than artificial coloring.

### 3. Beet and juice

A beet and juice treatment is commonly accustomed to add red undertones to blonde and lightweight brunette hair. You wish to combine three elements of beet juice with one a part of juice and saturate your hair with the mixture. Let it sit for regarding AN hour then rinse it out with shampoo.

### 4. Henna

Henna is one of the foremost common natural hair coloring treatments [35]. Create a paste out of henna powder and water and apply this to your hair. Let it sit for a handful of hours then proceed to shampoo and condition your hair.

### 5. Lemon and Honey

Lemon and honey work well along to lighten your hair and provides you natural highlights. Combine equal elements of the 2 ingredients and apply it to your hair. Sit go into the sun for AN hour or apply heat employing a drier. Wash the mixture out with shampoo then proceed to condition. You would possibly get to repeat this method a handful of times to urge visible results.

While it will be fun experimenting with colors, the harm they cause within the sort of dry and brittle hair will dampen the fun. Hence, it's perpetually an honest plan to change to safer and a lot of natural alternatives.

## How to Keep Your Hair Color for long

*Wear a hat:* Protective your hair from the weather helps forestall the formation of free radicals, atoms, or molecules that contribute to attenuation once they snatch electrons from pigment molecules.

*Suds up less frequently:* The additional you wash your hair, the quicker your color can fade. Shampooing causes the hair strands to swell, and also the color then washes out very little by little.

*Use color:* Protecting shampoo and conditioner. Color Expressions Shampoo works by protecting your hair cuticle thus your strands hold on to the dye within.

*Keep it cool:* Steaming quandary undoubtedly has sway on strands. Wet hair has additional stretch than dry hair, and also the "stretchiness" of hair will increase with the water temperature. This means the hair structure is additionally relaxed, which may permit additional pigment to flee.

*Pool rule:* Halogen may be a major offender in attenuation dye. Apply a bit deep conditioner to your locks before you dive in to shield and wash the hair. Then add a swim cap over the conditioner for an additional layer of protection.

*Conditioner use:* Deep condition your hair once you dye it to offset the injury from the method.

## Consent of Publication

Not applicable

## Conflict of Interest

Nil

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