Are You Color Conscious?

Hair coloring is one of the oldest hair beauty treatments—even ancient civilizations did it. But at what cost to our hair's health is this timeless beauty?

September 5, 2008

Ancient Egyptians, Greeks, Persians, Chinese, Hindus and others used plants (like henna) and metallic compounds to lighten or darken hair. Hair coloring was limited to herbal and natural dyes until the early 1900s when commercial dyes started using new chemicals like phenylenediamine for longer-lasting color.

Today, the two main ingredients in the hair-coloring process are hydrogen peroxide (a developer or oxidizing agent), which comes in varying forms and strengths to initiate the color-forming process, and ammonia. Ammonia is an alkaline that acts as a catalyst when permanent color comes together with peroxide. Ammonia separates the cuticle (outermost layer of the hair shaft) and allows the hair color to penetrate the cortex (layer under the cuticle) of the hair.

Now there is a debate over whether certain ingredients can be linked to cancer, developmental and reproductive toxicity, allergies and the irritation of eyes, skin and lungs.

Researchers at Procter & Gamble (P&G) Beauty say hair-dye products are the most studied and regulated consumer products due to two safety concerns: (1) a potential link to increased cancer risk and (2) skin allergy.

An overview of hair-dye safety by researchers from P&G Beauty concluded that "numerous epidemiologic studies have been conducted, evaluating a potential correlation between hair dye use and an increased risk for any possible cancer type. Taking all currently available epidemiology studies and state-of-the-art safety data into account, it is concluded that hair dyes do not pose an increased cancer risk, either for consumers and clients, or for professional hairdressers. Like other products, such as certain foods or drugs, hair dyes can cause allergic reactions in a few sensitive individuals."

"Regarding skin allergy," states Linda Loretz, PhD, DABT, director of safety and regulatory toxicology for the Personal Care Products Council, "like many other common consumer products, such as certain foods or over-the-counter drugs, hair dyes can cause allergic reactions in some individuals. Severe allergic reactions, however, are extremely rare. It is recommended that a skin sensitivity test be conducted 48 hours before applying a hair dye in order to reduce the risk of any

allergic reactions."

According to the Food and Drug Administration (FDA), hair-dye ingredients have been extensively tested over many years and have been found not to pose a definitive risk of cancer. Through testing individual dye ingredients and other ingredients in hair products, hair dyes are assessed to make sure that they do not cause irritation and unusual incidences of allergic reactions. "Hair dyes have been extensively tested for safety by independent scientists, as well as industry scientists, and safety assessments are updated to meet current safety standards," Loretz tells Real Health.

But opponents of chemical ingredients in hair dye, such as environmentalists and naturalists, point to studies that find chemicals in semipermanent and permanent hair color can be absorbed into the skin, causing health issues, from allergic reactions to respiratory problems to cancer. Other studies, however, show no threat to health. "Regarding cancer allegations, there are a large number of epidemiological studies relating to hair dyes and cancer," says Loretz. "An independent review conducted in 2003 of more than 80 epidemiology studies on hair dyes concluded that no causal link has been established between long-term use of hair dyes and any type of cancer. In 2006, an additional 17 studies conducted since the 2003 review were evaluated, and the conclusion remained unchanged."

A recent study led by Yawei Zhang, MD, PhD, of the Yale School of Public Health, and published online in the April 2008 issue of the American Journal of Epidemiology, pooled information from four published studies. The new study found that women who began using hair dye before 1980 (after that year, hair-dye formulas were changed to eliminate certain coal tar ingredients) showed an increased risk of follicular lymphoma (FL). For women who began using hair dye in 1980 or afterward, increased FL risk was limited to users of dark-colored dyes, which have a stronger concentration of chemicals.

In the face of studies deemed inconsistent and inconclusive, however, cosmetic industry professionals maintain that hair dyes are safe. "Hair dyes are among the most thoroughly studied personal care products," Cindy Orr, Aveda's director of research and development, tells Real Health. "Scientists have conducted numerous studies to determine whether hair-dye ingredients cause harm to consumers' health. These studies have found that the hair dyes on the market today are safe when used as directed. Aveda maintains strict quality testing and regularly reviews ingredient safety information. Aveda is dedicated to developing formulas with increased percentages of plant-based ingredients, such as our Full Spectrum Deposit-Only Color Treatment, which is up to 99 percent naturally derived so it's safer for the guest and the planet."

Still, the FDA reports that some ingredients in hair dyes have been reported to cause cancer in animals and can penetrate human skin. The FDA now requires that hair dyes bear a caution statement and appropriate patch-test instructions so that consumers can determine whether using a product will cause skin irritation or other problems. "First of all, it's important to stress that hair color is best applied in a professional environment," Orr says. "Hair colorists are specifically trained to avoid consumer skin contact with hair dyes. We recommend [that] guests investigate hair-color services that rely upon natural and botanically derived ingredients."

Shades of Gray

Though many people color their hair to achieve a fresh look and to follow the latest beauty trends, many men and women do so to conceal gray hairs. An inevitable part of aging, gray hairs can affect the self-esteem and and image of men and women alike.

Why do we get gray hair? Melanin is a chemical produced by cells within each hair follicle and is responsible for giving hair its color. As we age, the pigment cells at the base of the hair follicles stop producing melanin and become transparent, making hair look gray or white if there are no pigment cells at all. To date, there is no evidence that anything can be done to stop the onset of gray hair. Currently, researchers don't know
why hair follicles stop producing melanin, but they believe that in the future pigment cells in gray hair follicles may be coaxed into creating melanin again.

Premature gray. Sometimes, however, going gray doesn't necessarily mean that the body's aging process has sped up. At times a few gray hairs are known to develop in children, even those as young as 8. Premature gray is defined as "the onset of graying before the age of 20 in Caucasians and before the age of 30 in African Americans, or when 50 percent or more of the scalp hairs turn gray before the age of 50," Jerome Z. Litt, MD, an assistant clinical professor at Case Western University in Cleveland, told WebMD. Premature graying has been associated with certain medical conditions, such as thyroid disorders, vitiligo, vitamin B-12 deficiency and anemia. Premature graying has also been linked to decreased bone density in postmenopausal women, which is a risk factor for osteoporosis. In addition, premature graying may be caused by hormonal imbalance, including hyperthyroidism and hypothyroidism; malnutrition and pernicious anemia (graying of hair along with symptoms of fatigue, shortness of breath and possible chest pains); and genetic disorders such as Hutchinson-Gilford progeria syndrome (premature aging), Werner's syndrome (an autosomal recessive disorder characterized by premature aging that develops after puberty) and myotonic dystrophy, a disorder of the muscles and other body systems and a common form of muscular dystrophy that begins in adulthood.
