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Hair Dyes and Cancer Risk

Many people use hair dyes, which can contain different types of chemicals. Studies have looked at hair dyes as a possible risk factor for various types of cancer. Here is what the research shows so that you can make choices that are comfortable for you.

- [Types of hair dyes](#)
- [How are people exposed to hair dyes?](#)
- [Do hair dyes cause cancer?](#)
- [Are hair dyes regulated?](#)
- [Should I avoid or limit my exposure to hair dye?](#)

Types of hair dyes

Hair dyes vary greatly in their chemical make-up. There are 3 main types of hair dyes:

- **Temporary:** Temporary dyes cover the surface of the hair but don't penetrate into the hair shaft. They generally last for 1 to 2 washings.
- **Semi-permanent:** Semi-permanent dyes do penetrate into the hair shaft. They typically last for 5 to 10 washings.
- **Permanent (oxidative):** Permanent dyes cause lasting chemical changes in the hair shaft. They are the most popular types of hair dyes, because the color changes last until the hair is replaced by new growth. These dyes are sometimes referred to as **coal-tar dyes** because of some of the ingredients in them. They contain colorless substances such as aromatic amines and phenols. In the presence of hydrogen peroxide, these substances go through chemical reactions to become dyes. Darker hair dyes tend to use more of these coloring agents.

Most of the concern about cancer risk has been with the semi-permanent and

get a better idea if these dyes increase cancer risk.

What expert agencies say

Several national and international agencies study substances in the environment to determine if they can cause cancer. **The American Cancer Society looks to these organizations to evaluate the risks based on the available evidence.**

Based on studies in people and studies done in the lab, some of these expert agencies have classified hair dyes or their ingredients as to whether they can cause cancer.

The **International Agency for Research on Cancer (IARC)** is part of the World Health Organization (WHO). One of its major goals is to identify causes of cancer. IARC has concluded that workplace exposure as a hairdresser or barber is “probably carcinogenic to humans,” based on the data regarding bladder cancer. (The evidence for other types of cancer is considered mixed or inadequate.) But IARC considers personal hair dye use to be “not classifiable as to its carcinogenicity to humans,” based on a lack of evidence from studies in people.

The **US National Toxicology Program (NTP)** is an interagency program of the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), and the Food and Drug Administration (FDA). The NTP has not classified the potential of hair dyes to cause cancer. However, it has classified some chemicals that are or were used in hair dyes as “reasonably anticipated to be human carcinogens.”

(For more information on the classification systems used by these agencies, see [Determining if Something Is a Carcinogen¹](#) and [Known and Probable Human Carcinogens²](#).)

Are hair dyes regulated?

In the United States, the Food and Drug Administration (FDA) regulates the safety of cosmetics, including hair dyes, but by law there are limits on what the FDA can do. For example, the FDA does not approve each ingredient used in hair dyes before it goes on the market, and in general the responsibility for the safety of products and ingredients falls to the manufacturers.

The FDA can take action if any cosmetics are found to be harmful or in violation of the law (such as being mislabeled). This includes any new ingredients to be used in hair dyes. However, many of the older ingredients in hair dyes (some of which are still in use) were excluded when the FDA was initially given the power to regulate these

products back in the 1930s.

If cosmetics (including hair dyes) or their ingredients are found to be unsafe, the FDA can request that the company recall the product, although it can't require a recall. The FDA can, however, take further steps if needed, such as getting a federal court order to stop sales, requesting that US marshals seize the product, or initiating criminal action.

Should I avoid or limit my exposure to hair dye?

It's not clear how much personal hair dye use might raise cancer risk, if at all. So far, most studies have not found a strong link between hair dye use and cancer, but more research is needed to help clarify this issue.

Other than recommendations that apply to everyone (such as not smoking, eating a healthy diet, being physically active, and getting routine screening exams), there is no specific medical advice for current or former hair dye users. Smoking is a known risk factor for bladder cancer and some types of leukemia (as well as many other cancers and other diseases), and quitting smoking can improve your health, regardless of whether or not you use hair dyes.

Some people might want to avoid or limit their exposure to hair dyes for other reasons. For example:

- Some of the ingredients in hair dyes can cause serious allergic reactions in some people.
- Hair dyes can cause hair loss in some people.
Some doctors advise women to avoid having their hair dyed during pregnancy (or at least until after the first trimester). Not enough is known about hair dye use during pregnancy to know for sure if this is a problem, but doctors might

- so it's important to keep checking.)
- Wear gloves when applying hair dye.
 - Don't leave the dye on your head any longer than the directions say you should.
 - Rinse your scalp thoroughly with water after use.
 - Never use hair dye to dye your eyebrows or eyelashes. This can hurt your eyes. You might even go blind. The FDA **does not allow** hair dyes to be used for eyelashes and eyebrows.
 - Keep hair dyes out of the reach of children.
 - Do not scratch or brush your scalp for three days before using hair dyes.
 - Do not dye your hair if your scalp is irritated, sunburned, or damaged.
 - Wait at least 14 days after bleaching, relaxing, or perming your hair before using dye.

Some hair dye products are vegetable based. These products may have some drawbacks, such as not being able to change hair color drastically or having the color fade sooner than is seen with permanent dyes (unless they contain some of the same ingredients as the permanent dyes). But they could be another option for those people concerned about hair dye safety.

Hyperlinks

1. www.cancer.org/cancer/risk-prevention/understanding-cancer-risk/determining-if-something-is-a-carcinogen.html
2. www.cancer.org/cancer/risk-prevention/understanding-cancer-risk/known-and-probable-human-carcinogens.html
3. www.fda.gov/
4. www.fda.gov/cosmetics/cosmetic-products/hair-dyes
5. www.cancer.gov/
6. www.cancer.gov/about-cancer/causes-prevention/risk/myths/hair-dyes-fact-sheet

Additional resources

In addition to the American Cancer Society, other sources of information and support include*:

Food and Drug Administration (FDA) Website: www.fda.gov³ Hair Dyes: www.fda.gov/cosmetics/cosmetic-products/hair-dyes⁴

National Cancer Institute (NCI) Toll-free number: 1-800-422-6237 (1-800-4-CANCER)
Website: www.cancer.gov⁵ Hair Dyes and Cancer Risk: www.cancer.gov/about-cancer/causes-prevention/risk/myths/hair-dyes-fact-sheet⁶

**Inclusion on this list does not imply endorsement by the American Cancer Society.*

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Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as editors and translators with extensive experience in medical writing.

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