Cosmetics and Cancer Risk

Ingredients used to make consumer products (including cosmetics) have come under increased scrutiny for their possible effects on human health and on the environment. This is in part fueled by the increase in information on the Internet about the chemicals in consumer products, including cosmetics.

This document is a brief overview of cosmetics, how they are regulated, and what is (and is not) known about their possible health effects, as part of the American Cancer Society's role in informing and educating people about cancer and its possible causes. The American Cancer Society does not maintain lists of the chemicals used in cosmetics or have position statements about specific ingredients or products. A list of websites addressing these issues is provided later in this document.

What are cosmetics?

According to the US Food and Drug Administration (FDA), the law defines cosmetics as "articles intended to be rubbed, poured, sprinkled, or sprayed on, introduced into, or otherwise applied to the human body... for cleansing, beautifying, promoting attractiveness, or altering the appearance." This includes skin moisturizers, perfumes, lipsticks, fingernail polishes, eye and facial makeup, shampoos, permanent waves, hair colors, toothpastes, and deodorants, as well as any component of a cosmetic product. It does not include products used solely as soaps.

Cosmetics are different from drugs, which are defined as "articles intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease" and "articles (other than food) intended to affect the structure or any function of the body of man or other animals."

This difference is important when it comes to federal oversight of these products, which is described in the section "How are cosmetics regulated?"

Do cosmetics cause health problems?

Cosmetics include a wide range of products. Some of these can cause health problems in some people, such as skin or eye irritation or allergic reactions. These types of problems are usually short-term and go away if use of the product is stopped.

Whether cosmetics or certain ingredients in them cause more subtle or long-term health problems is not entirely clear. Uncertainty exists because many products and ingredients have not been tested thoroughly. Even when ingredients in cosmetics have been tested, the results may not always be simple or clear cut. For example, some ingredients in cosmetics have been found to be toxic in large amounts (or at high concentrations). But the amounts of these ingredients used in cosmetics is typically

Very little information is available on long-term health impacts of most cosmetic ingredients or cosmetic products. It is difficult to test the ingredients in cosmetics for harmful long-term health problems such as cancer. For most substances that cause cancer, it takes many years after exposure to the substance for cancer to occur. That means the studies would need to go on for at least 10 or 20 years to see if a certain substance or cosmetic caused cancer. It is also not practical to test every combination and dose of these ingredients in the actual cosmetic products. This is made especially difficult by the fact that ingredients (and combinations) change frequently. That means looking at the risk from a certain cosmetic (for example a lipstick) over time would be complicated by the fact that, even if the people in the study kept using the same product over many years, the product itself would likely change.

Therefore, scientists must resort to other types of tests – typically of only 1 or 2 ingredients at a time and at much higher doses and through different routes of exposure than people would normally have through typical use of cosmetics– to try to determine the potential of a chemical to cause cancer.

Lab studies

Scientists get much of their data about whether something might cause cancer from lab studies using cell cultures and animals. Because there are far too many substances (natural and man-made) to test each one in lab animals, scientists use knowledge about chemical structure, other types of lab tests, and other factors to select chemicals for testing. They can often get an idea about whether a substance might cause problems by looking at its chemical structure and comparing it to similar chemicals.

Virtually all substances known to cause cancer in humans also cause cancer in lab animals. But the reverse is not always true – not every substance that causes cancer in lab animals causes cancer in people. There are different reasons for this.

First, most lab studies of potential carcinogens (cancer-causing substances) expose

inhaled, or injected into the blood. The duration and dose of the exposure also help determine the degree of risk.

Finally, the bodies of lab animals and humans don't always process substances in the same way, so a substance that may cause harm to one may not have the same effect on the other. As an example of this type of difference, you may like chocolate, but you probably know that it could make your dog very sick.

Most of the ingredients in cosmetics that have been tested in animals for long-term health effects were studied in ways that apply more towards the effects of higher dose exposures that may be seen in workplace settings. It isn’t always clear how the results of these studies apply towards exposure to the same substances in cosmetics.

Despite these limitations, laboratory studies are the best way to detect the potential for a substance to cause cancer in humans before widespread exposure occurs.

Epidemiologic (population-based) studies

Same data, different views

Information about cosmetics is often presented with widely divergent points of view with respect to the potential for health problems.

Innocent until proven guilty?

There are those who believe that the products are adequately regulated, and that because they haven't been shown to cause problems they should be considered completely safe. The weakness of this argument is that there are many gaps in the evidence, particularly on the extent to which the ingredients in cosmetics can be absorbed and build up in the body. Further, just because a substance hasn't been shown to cause a problem doesn't ensure that it is risk-free.

Most scientists and regulatory agencies believe that it is very unlikely that cosmetic ingredients have serious health effects because of the low dose from such exposures, even with regular use. The assumption that the doses are low is generally based on the low levels of specific substances in cosmetic products, the limited areas of the body where they are used, as well as limited absorption through the skin. However, these assumptions are not always correct. For example, benzophenone-3, an ingredient in some sunscreens, can be measured in urine samples from most people in the United States.

Better safe than sorry?

There also are people who believe that *any* evidence that a substance may be linked to cancer, regardless of the dose or route of exposure, should cause it to be banned from use, if possible. This is the perspective taken by some advocacy groups such as the Campaign for Safe Cosmetics.

Particularly controversial are chemicals considered to be "endocrine disruptors," which can mimic the natural hormone estrogen. When made by the body or given as a drug, estrogen affects reproductive organs and can raise the risk of certain cancers. There is a good deal of controversy about the effects of much lower exposures to chemicals that mimic estrogen in the body. Some groups have called for banning all such substances. This is complicated, because certain foods such as tofu and soy milk contain these compounds naturally.

More data are needed

The American Cancer Society takes seriously its role as a provider of trusted, credible

information on issues related to cancer. Such information is essential for individuals and regulatory agencies to make informed decisions about the safety of consumer products. More information is needed on the extent to which the ingredients in cosmetics are absorbed and retained in the body during normal usage, especially in groups who may be especially vulnerable to ill effects, such as infants, pregnant women, and the elderly. Furthermore, the American Cancer Society supports the need for open and transparent regulatory oversight of cosmetics and encourages continued and expanded scientific research on the potential links between cosmetic use and cancer risk. The need for an effective FDA in ensuring the safety of our food supply, medicines, and consumer products has never been greater.

In the meantime, people who are concerned about the possible health effects of cosmetics may wish to visit the websites listed in the References tab below to learn more about the products and what may be in them. Concerned individuals may choose to avoid certain products or to minimize or avoid cosmetic use altogether. Consumers should be aware that there is no evidence that cosmetic products labeled as "natural," "organic," or "green" are in fact safer than products that do not carry these labels.

The American Cancer Society continues to support the use of sunscreen products as one of the measures to limit skin exposure to ultraviolet radiation[3], while encouraging continued research on the safety and efficacy of these products.

Hyperlinks

1. www.cancer.org/cancer/risk-prevention/chemicals/hair-dyes.html
2. www.cancer.org/cancer/risk-prevention/understanding-cancer-risk/known-and-probable-human-carcinogens.html
3. www.cancer.org/cancer/risk-prevention/sun-and-uv/uv-radiation.html

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Last Revised: May 28, 2014

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