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If Looks Could Kill

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Lead in lipsticks... microbes in mascara...hormones in shampoo...Should you be worried?

There's nothing that makes you sweat like opening an innocuous e-mail to find a warning about antiperspirants causing breast cancer. Or reading a story in *The New York Times*, as I did recently, suggesting that breast growth in some boys has been linked to certain shampoos. From toxic moisturizers to chemical-laden perfumes, there has been unavoidable buzz recently about health risks—from slightly alarming to deeply scary—lurking in beauty products. In an effort to separate real dangers from speculation, I quizzed scores of dermatologists, chemists, and toxicologists. Here's the (mostly good) news.

Lipstick

The fears: Back in 2003, the Internet hummed with rumors warning that many brands of lipstick were laced with dangerous amounts of lead. The American Cancer Society quickly dismissed the talk. But recently, similar reports have resurfaced.

The facts: Lipsticks are safe. Most color additives are no longer made from coal tars that contain high amounts of lead. Almost all pigments now come from petroleum, and the FDA certifies each batch. "You'll find far more lead and mercury in the foods you eat than the lipstick you wear," says Ni'Kita Wilson, a cosmetics chemist at Cosmetech Labs in Fairfield, New Jersey.

Hair Dye

The fears: A handful of studies have associated long-term use of permanent hair dyes with a slightly higher risk of several types of cancer. Some studies reported a greater risk for those who started coloring their hair before 1980. (In 1979 the Food and Drug Administration asked cosmeticmakers to put warning labels on hair dyes containing coal-tar derivatives that had been found to cause cancer in lab animals. Instead, manufacturers voluntarily removed the ingredients.)

The facts: "Any and all potentially carcinogenic ingredients in hair dyes were removed from the market years ago," says Wilma Bergfeld, head of clinical research and dermatopathology at the Cleveland Clinic and chair of the Cosmetic Ingredient Review (CIR) expert panel. (The CIR is a group of scientists and physicians responsible for assessing the safety of cosmetic ingredients in the United States.) And, in fact, no study has ever shown that haircolor causes cancer in humans. Scientists analyze hair-dye use among healthy women and those with cancer, and then draw correlations based on that information. A recent study in *The Journal of the American Medical Association* reviewed nearly 80 studies from the past 40 years and found no strong evidence linking hair dye to cancer. And most experts say you can keep coloring—within reason—during pregnancy. "No one can tell you with 100 percent certainty that it's completely safe, so try to minimize it; that's what I did when I was pregnant," says Doris J. Day, MD, clinical assistant professor of dermatology at NYU Medical Center. "Wait until your second trimester, and then extend the time between coloring. If you usually color every six weeks, go eight."

Sharon Dorrarn-Krause, head colorist at John Frieda Salon in New York City, advises pregnant clients to consider getting only highlights (to keep chemicals off the scalp) or using weaker, semipermanent dyes.

Mascara

The fears: Wielding a sharp wand around your eyes always carries a certain amount of risk, of course, and you've probably heard about nasty infections borne of ancient (or shared) mascara tubes.

The facts: Mascara perils do exist but can easily be avoided. For starters, don't use your rearview as a vanity mirror. "Every ophthalmologist I know has treated corneal ulcers [open, infected wounds on the cornea] caused by women who poke themselves in the eye while attempting to apply mascara in a moving vehicle," says Marguerite McDonald, MD, clinical professor of ophthalmology at Tulane University School of Medicine in New Orleans. (The ulcers are painful but can be healed with antibiotics.) Keep your mascara in a cool place; heat will quickly degrade its preservatives. Most tubes contain enough to fight bacteria for three months. When applying mascara, stop at two coats. Caked-on color can plug up the oil gland openings along the edge of your lids, leading to sties. And always remove mascara before bed so it doesn't trap infection-causing bacteria on your lashes or flake into your eyes while you sleep.

Shampoo

The fears: First there was buzz about cancer-causing sulfates, the cleansing agents used to make loads of lather in shampoos (and soaps, foaming cleansers, and toothpaste). Then similar talk began swirling around diethanolamine (DEA) and its cousins—triethanolamine (TEA), cocamide DEA, and lauramide DEA, among others—which boost foaming action or neutralize the shampoo formula so it doesn't irritate. And just recently, even natural ingredients seemed to turn noxious, when *The New York Times* reported that Clifford Bloch, a pediatric endocrinologist at the University of Colorado School of Medicine, hypothesized that breast growth in several boys could be related to the tea tree and lavender oils in their shampoos. Could these oils actually be capable of mimicking estrogen and other hormones?

The facts: In the early eighties, the CIR determined that while all types of sulfates can, at high concentrations, irritate the skin and eyes, they are not carcinogenic. "And any irritant effect is usually neutralized by the rest of the formulation," says Bergfeld. Plus, since shampoo is on your head for only a few seconds—and in your eyes for far less time—irritation shouldn't be an issue. DEA acquired its bad rap through its use in metalworking fluids. When DEA mixes with certain nitrates in metalworking fluids, it produces toxins, explains Bill Jameson, PhD, a senior toxicologist with the National Toxicology Program at the National Institute of Environmental Health Sciences. "But nitrates aren't used in most cosmetics, and without their presence, DEA is entirely safe," says James Hammer, a cosmetics chemist at Pharmasol Corporation in Easton, Massachusetts. What about hormone disrupters? Natural ingredients can, indeed, have estrogen-like properties, but "you'd probably have to be swimming in the stuff to notice an effect," says Paul Foster, PhD, toxicologist with the National Toxicology Program. While in vitro (or test tube) studies did show that tea tree and lavender oils can promote breast development, many experts say the findings were limited and far from conclusive, so we have little reason to worry. But Paul Kaplowitz, MD, PhD, chief of endocrinology at Children's National Medical Center in Washington, D.C., still cautions, "When you see breast development in a 7- or 8-year-old, and he happens to be using these products, that doesn't prove the products are to blame—but you certainly have to consider the possibility. Until we have more evidence, I think it would be wise to avoid using products that contain lavender or tea tree oils, especially on children, who are more susceptible to estrogenic ingredients."

Deodorant

The fears: In the sixties, scientists linked aluminum—an ingredient in antiperspirants—to nerve cell damage in rabbits and theorized that the element might play a role in Alzheimer's. There has also been speculation that

antiperspirants could cause cancer by blocking sweat glands from expelling toxins. In 2004 a study in the *Journal of Applied Toxicology* reported finding parabens, widely used preservatives, in breast cancer tumors, and suggested that underarm cosmetics, like antiperspirants and deodorants, may be to blame.

The facts: "There is no evidence that aluminum is linked to the cause or progression of Alzheimer's disease," says William Pendlebury, MD, professor of pathology at the University of Vermont College of Medicine in Burlington. The toxin-trapping theory is also unfounded: "The idea that antiperspirants block the excretion of toxic substances is just plain wrong," says Michael Thun, MD, head of epidemiological research at the American Cancer Society. "We sweat principally as a way to control body temperature. Our bodies get rid of toxic and carcinogenic substances by excretion in stool or urine and through metabolism by the liver." The paraben issue is a bit trickier, because these preservatives can mimic estrogen in our bodies, and breast cells—including cancerous ones—tend to multiply in the presence of estrogen. However, "parabens are exceedingly weak estrogens, and when used in the minuscule amounts found in cosmetics, they have absolutely no effect," says Bergfeld. (Which means the parabens found in your moisturizers, cleansers, and haircare products are also safe.) And a recent study in the *Journal of the National Cancer Institute* concluded that antiperspirant use does not increase one's risk for breast cancer. In fact, most antiperspirants and deodorants don't even contain parabens (you might find them in water-based roll-ons, says Hammer, but not in sticks or sprays).

Perfume

The fears: Phthalates, a group of chemicals with many uses, are sometimes added to perfumes to prolong their life. Several studies have shown that certain phthalates can cause developmental abnormalities in male rats and humans. Researchers evaluating 379 men from an infertility clinic have also linked phthalate exposure to sperm damage. Another potential perfume risk: synthetic musks, the earthy base notes found in many fragrances. There are several kinds, and traces of certain ones have turned up in human fat tissue and breast milk, indicating that they can penetrate the skin. Some musks have been shown to be weak endocrine disrupters and cause neurological problems in animals, and can bring on contact dermatitis (red, itchy skin) and photosensitivity in humans.

The facts: "The diethyl phthalate [DEP] used in perfume poses no reproductive or developmental problems," says Foster, of the National Toxicology Program. (It was dibutyl phthalate, or DBP, that harmed the rats, and primarily DBP metabolites that were implicated in human studies.) After scrupulous testing, the CIR and the European Union's Scientific Committee on Consumer Products (the EU's equivalent of CIR) deemed DEP safe. The same is true for the synthetic musks used in cosmetics, says Jean-Pierre Houri of the Research Institute for Fragrance Materials (RIFM), the agency that assesses fragrance ingredients. "Mainly four musks are used today, and all have been proved safe," says Houri, adding that, in some cases, RIFM limits the amount of musk a scent can contain to further ensure safety.

Nail Polish

The fears: Based on the phthalate studies mentioned above, the EU decided to ban DBP, which is commonly used to make nail polish flexible and chip resistant. (They ignored their own risk assessment, which determined that DBP was actually safe for use in cosmetics. The EU operates by the "precautionary principle," so if any dose of a chemical shows certain negative effects—even in rodents—they ban it.) Formaldehyde, a nail hardener, and toluene, the stuff that keeps polish fluid, are both sanctioned by the EU and CIR, but studies show they may increase your risk of cancer and respiratory problems—if you work in a factory where you are exposed to vast quantities of these chemicals every day for a period of years.

The facts: The controversy surrounding these chemicals has led many beauty companies to remove DBP, toluene, and formaldehyde from their polishes. But many doctors say the ingredients offer little cause for serious concern. Contact dermatitis is the primary risk you run by painting your nails with polishes that contain formaldehyde and toluene, says Jeannette Graf, MD, clinical assistant professor of dermatology at NYU Medical

Center. Both chemicals are more likely to cause irritation when they're moist, so try to keep freshly polished nails away from your skin until they're completely dry. There is no cancer or respiratory risk in inhaling their fumes in normal doses. As for DBP, according to calculations from the American Chemistry Council's Phthalate Esters Panel, you could use almost five bottles of nail polish every single day of your life—and absorb every bit of DBP in each bottle—and you still wouldn't reach the dose that caused problems in rodents. Plus, CIR studies have shown (and dermatologists agree) that nails are quite impermeable. The DBP studies on humans are highly controversial, and experts in the medical community are quick to point out flaws in the research. About phthalates and sperm damage: Marian Stanley, manager of the Phthalate Esters Panel, takes issue with the fact that "the samples were from infertile men, and there were no controls examining healthy, fertile men." She adds that the study's authors themselves admit their results are inconclusive and that more research is needed.

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