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# Clean cosmetics: The science behind the trend

POSTED MARCH 04, 2019, 10:30 AM , UPDATED MARCH 12, 2019, 2:19 PM



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Walking into the skin care aisle at the pharmacy, stepping up to a counter at a department store, or stopping by a cosmetics shop can be an overwhelming experience. Everywhere you look, you see products touting the ideal skin care ingredient. Who knew buying a moisturizer could be so difficult?



Lately, the coverage of “clean” cosmetics is everywhere — on national television and in best-selling books. It’s clear that clean is the newest beauty trend. But what is the clean cosmetics movement, and does the science support it?

## Regulatory oversight of cosmetics: A brief history

The clean cosmetics movement seems to have arisen from frustration over regulatory oversight of cosmetics and personal care products (lotions, toothpastes, shampoos, etc). The FDA passed the Federal Food, Drug and Cosmetic Act back in 1938. Yet, ingredients used in cosmetics (with the exception of color additives) are exempt from FDA regulatory practices. This includes the need for approval or product recall if an ingredient is found to be dangerous. Instead, most regulation of cosmetics comes from the Personal Care Products Council, which is a self-regulating body supported by the cosmetics industry.



Some took issue with this perceived conflict of interest. Activist groups, including the Environmental Working Group and the Campaign for Safe Cosmetics, took matters into their own hands by classifying certain ingredients found in commercial cosmetic and personal care products as harmful and not suitable for topical use. Online and retail stores followed suit; some sell only clean products, while others have developed specialty lines of clean products.

Each proponent of this movement has developed their own short list of “bad” ingredients. The majority of these chemicals fall into one or more of three major categories: irritants or allergens; potential endocrine disruptors (substances that may imitate our body’s natural hormones and interfere with normal signaling of these chemical messengers); and potential carcinogens (cancer-causing agents).

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## Irritants and allergens

**Commonly avoided in clean cosmetics:** Methylisothiazolinone (MI), methylchloroisothiazolinone (MCI), vitamin A derivatives, fragrance, phenoxyethanol, petroleum distillates, and formaldehydes.

**What does the science say?** MI/MCI, fragrance, and formaldehyde are known causes of **contact dermatitis**, a poison ivy-like rash that can become chronic with repeated topical exposure. In fact, all three have been named “Allergen of the Year” by the American Contact Dermatitis Society, due to their prevalence in commonly used products and frequent association with contact dermatitis.

## Potential endocrine disruptors

**Commonly avoided in clean cosmetics:** Triclosan and triclocarban, toluene, resorcinol, petroleum distillates, butylated hydroxyanisole (BHA), boric acid and sodium borate, phthalates, placenta extract, parabens, and phenoxyethanol.

**What does the science say?** The jury is still out. Many of the studies showing a direct relationship between these compounds and hormonal dysregulation have been performed in animals rather than in humans, and at higher doses than people would typically be exposed to through a cosmetic or personal care product. Some human studies have related an increase in urinary or blood levels of these chemicals to endocrine disruption; however, it is difficult to interpret if or how individual measurements of these chemicals in bodily fluids relate to exposure from cosmetics or personal care products.

## Potential carcinogens

**Commonly avoided in clean cosmetics:** 1,4-dioxane, formaldehydes, coal tar ingredients, petroleum distillates, and placenta extract.

**What does the science say?** Formaldehyde has been named by the National Cancer Institute as a potential carcinogen, and for good reason: it has been linked to cancer formation in both animals and humans at high doses. As if that isn't enough reason to avoid this product, formaldehyde ranks among the top 10 most common contact allergens. Industrial use of coal tar products has been linked to cancer (for instance, in chimney sweeps); however, coal tar products have been used in dermatology topically, to treat psoriasis and eczema, for years without any increased rate of skin cancer or internal cancers. Petroleum distillates that are highly refined, like those in personal care products or cosmetics, do not appear to cause cancer. 1,4 dioxane has been linked to cancer in animals, while studies about placenta extract are lacking in both animals and humans.

## The bottom line

The clean cosmetics movement definitely has us taking a closer look at what we put on our skin, which is a good thing. Scientific evidence appears to support avoiding at least a handful of ingredients that could be lurking in your personal care products, including MI/MCI, fragrance mix, and formaldehyde. Avoiding these ingredients is a good place to start, **but you don't need to toss out your whole makeup bag quite yet:** more studies are needed to back up associations between low-dose topical exposure to many of these chemicals and human health.

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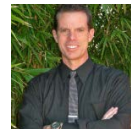
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POSTED MARCH 8TH, 2019 AT 8:58 PM

**Sharon Ekstrand**

What about ammonia, which is found in most hair dyes? Could it be harmful to the brain? I once found an approximately 1/2 inch hole in the cement floor of our garage where ammonia had leaked from its container.

POSTED MARCH 5TH, 2019 AT 11:38 PM

**azure**

"Clean" is a misnomer, clean has nothing to do with the issue, non-toxic is a far better term.

"and at higher doses than people would typically be exposed to through a cosmetic or personal care product." Sounds nice until you recognize that people are exposed to phthalates from many other sources, many types of cans as well as other commonly used/sold/ sources. Makes sense to eliminate ANY source when possible. In addition, Hawaii has banned "the distribution of sunscreens containing the chemicals oxybenzone and octinoxate that scientists have found contributes to coral bleaching when washed off in the ocean." from a NYT article, so it's not just exposure to humans—it's possible for a person to wish to avoid further contaminating/polluting or damaging the environment—and needlessly so. How many of the chemical compounds listed in the article are now present in many water supplies? Joining antibiotics, anti-depressants, traces of illegal drugs . . . .

There's no mention, let alone discussion, in this article regarding the possible effects cumulative exposures as well as potential synergistic effects exposure to multiples of the above & other pretty ubiquitous compounds (such as glycolate) of humans—including children— (animals, beneficial insects, amphibians, fish, plants, etc). Or to at least ten of the chemical compounds listed in the above article. Possibly because so little research has been done and it's unlikely either the NSF or any corporation will do so.

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POSTED MARCH 5TH, 2019 AT 1:57 PM

**Cathy Gunn**

What about red dye?

POSTED MARCH 5TH, 2019 AT 10:04 AM

**Perry**

You could have dug a little deeper into this subject on some of the topics. For example, no large company in the cosmetic industry is adding formaldehyde to their formulas. Instead ingredients like DMDM Hydantoin or Diazolidinyl Urea are used which are formaldehyde donors. There is no evidence that formaldehyde donors used in cosmetics cause cancer.

You should also have noted that the EWG and the Campaign for Safe Cosmetics are not science-based organizations. They do not make assessments of ingredients based on what Toxicologists say.

POSTED MARCH 7TH, 2019 AT 6:21 PM

**Lucia**

“There is no evidence that X (or Y or Z) causes cancer (or any other harm) “: such statements in my opinion may sound “evidence-based”, but can also be read as “there is no evidence either that they are safe” (or effective for that matter). Most users would prefer evidence of safety, at least, for compounds to be used on (or in) their bodies. More so if we take into account the fact that the sole purpose of many ingredients in the cosmetic industry is to reduce production costs (replacing more expensive ingredients, extending shelf life to ease distribution) or just make the product more appealing (color, smell, etc. ) but have no cosmetic function at all.

The way evidence is presented always matters. As an example, while there is evidence that high levels of exposure to sunlight are a risk factor for skin cancer, it does not imply, as is often touted even by health professionals, that you should use a sunscreen: staying in the shade or covering up (clothes, hats and umbrellas...) have a perfect record for safety and effectiveness. Using solar cosmetics in order to stay longer in the sun reminds me of ancient Roman banquets, in which guests voluntarily vomited in order to eat more...

POSTED MARCH 10TH, 2019 AT 11:07 PM

**Perry**

With all due respect, you should investigate further if you believe that “...the sole purpose of many ingredients in cosmetics...is to reduce production costs...” You will soon learn that this is mistaken.

For example, all colors added to cosmetics must be FDA approved. The government guarantees safety. Fragrances are added to products because consumers prefer fragranced products over ones that are not fragranced. If it was all about creating the least expensive product, fragrances would not be added. Preservatives are added because they make products safer. Ingredients are added because they have a purpose in cosmetics & it is not just to make formulas cheaper. Price is

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not that important when you can charge \$30 for a 2 once product.

Also, perhaps you are not trained as a scientist but if you were you would understand that it is impossible to prove that something is safe. When you say “there is no evidence either that they are safe” this just demonstrates that you have not delved into the subject very deeply. You can see exactly what evidence of safety has been collected (by toxicologists) by going to the Cosmetic Ingredient Review website (<https://www.cir-safety.org/ingredients>), look up any ingredient like formaldehyde donor preservatives and you can see exactly what tests have been done to establish the safety levels of the ingredient.

Your comments about sunscreen are also at odds with the science and the recommendations of the American Academy of Dermatology.

<https://www.aad.org/media/stats/prevention-and-care/sunscreen-faqs>

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