

Chemicals in Personal Care Products

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The chemicals used in personal care products are largely unregulated and untested. Only within the last five years has it been mandatory for companies to include a list of ingredients on product labels, however, companies are not required to list the amounts of each ingredient. It is the opinion of the authors that chemicals have replaced bacteria and viruses as a major threat to health.

In personal care products (PCPs), it is the low-level, long-term exposure to chemicals that is the main concern. As currently there are no standards for using the terms “natural”, “organic”, “green”, “fresh”, “pure”, “eco-friendly” or “botanical” on cosmetic labelling, there is a high potential for consumer confusion.

The Concern

In the United States, the FDA Office of Cosmetics and Colors reports that cosmetic manufacturers can use nearly any raw material as an ingredient without premarket approval.¹ Under this policy, the FDA has only reviewed the safety of 11% of the more than 10,500 chemicals, additives and fillers used in the PCP industry. The only ingredients prohibited under the FDA include: bithionol, chlorofluorocarbon propellants, chloroform, halogenated salicylanilides, methylene chloride, vinyl chloride, zirconium-containing complexes and prohibited cattle materials.

The following ingredients may be used in cosmetics under the restrictions stated in the regulations: hexachlorophene, mercury compounds and sunscreen ingredients. The presence of lead and other heavy metals is virtually unregulated.

The PCP Industry in Canada is regulated by the Food & Drug Act and the Cosmetic Regulations. Health Canada (HC) provides an extensive list of chemicals in personal care products (http://www.hc-sc.gc.ca/cps-spc/cosmet-person/indust/hot-list-critique/hotlist-liste_ac-eng.php), referred to as the “Cosmetic Ingredients Hotlist”, where caution or prohibition is advised. The list is a good first step, but it does not carry the same authority as legislated regulations

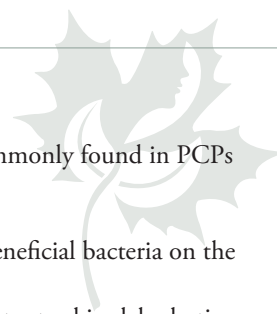
and there are products that are banned from use in Europe, such as dibutyl phthalate, that are not on HC’s Hotlist.² With the growing research linking chemicals to chronic health issues, the authors recommend that naturopathic doctors continue to take more of a precautionary approach and include an assessment of PCPs and the chemicals involved as part of the search for causal factors of disease.

In a recent report titled, “Heavy Metal Hazard” from the Environmental Defence (www.environmentaldefence.ca) it was found that cosmetic products contain heavy metals. Although the intentional adding of heavy metals is banned, the concern is that they are still appearing in the products. In the report seven of the metals were found throughout the products, and all items had at least two heavy metals in them. The main metals that were present included arsenic, cadmium, lead and mercury. To read more about this report go to <https://www.greenbiz.com/news/2011/05/18/canada-under-pressure-regulate-heavy-metals-cosmetics>.

One of the groups that focuses on identifying concerns in cosmetics is the Environment Working Group (www.ewg.org). They also have a cosmetic database (<http://www.ewg.org/skindeep/browse.php?maincat=skincare>) to assist consumers and practitioners in identifying “clean” products. In 2004 the EWG evaluated 14,841 name-brand personal care products and found that more than one-third contained at least one industrial chemical ingredient linked to cancer and 79.1 per cent of the sample contained harmful impurities that include known or probable carcinogens, pesticides, reproductive toxins, plasticizers or degreasers.³ The average consumer (including teens) uses 15 to 25 cosmetic PCPs a day, amounting to an exposure rate of approximately 200 chemicals per day.⁴

The Largest Organ - Skin

Like all aspects of health, the safety of PCPs depends not only on the chemicals that are in the products, but also on a person’s susceptibility to these chemicals based on medical history, genetic variability and individualized biochemistry. The skin contains a very fine, slightly acidic film on its surface, often referred to as the skin mantle, that serves as a barrier against bacteria, viruses, and other potential contaminants. This film is composed of sweat and sebum and it provides the skin with its protective abilities. This protective layer is supported or injured depending on which PCPs we choose, the internal health of the body, and how we treat and support the skin.



The Chemicals

Generally, over 80% of the ingredients in PCPs are synthetic. The side effects associated with PCPs include: mild to severe allergic reactions, disruption to the endocrine, nervous, respiratory or immune systems and have mutagenic and carcinogenic properties, especially with long-term exposure. Most cosmetic products are formulated for a shelf-life of over three years, and as a result these products typically contain large amounts of preservatives, such as parabens, for example, to prevent spoilage. These preservatives are known cellular toxins.²

The chemicals that are the most important to avoid are those that have a name ending in “acid”, as well as alcohol, parabens, phthalates, sodium laureth and its derivatives, propylene glycol and synthetic colours and fragrances.

Propylene glycol (PEG), is an inexpensive glycerine substitute found in hair products, facial moisturizers and cleaners, body wash and sunscreen. It is also used as an industrial petrochemical. The concern is that PEG is often contaminated with 1,4-dioxane or ethylene dioxide which are suspected carcinogens. Although 1,4-dioxane can be removed from products easily and economically there is no way to determine which products have undergone this process as companies are not required to list this information on labels. PEG has been linked to decreased skin moisture, weakening of protein and cellular structure, irritation of nasal and respiratory passages, kidney disease, liver abnormalities, neurotoxicity and endocrine disruption.

Sodium lauryl sulfate/sodium laureth sulphate (SLS) is used as a foaming agent and the concern is that it can form toxic nitrosamines. When sodium laurel sulfate is combined with ethylene oxide (ethoxylized) to create the milder sodium laureth sulfate, it too may become contaminated with 1,4-dioxane. SLS is found in shampoos, hair conditioners, body wash, facial creams, lotions and soaps. It is also found in car wash soap, engine degreasers and garage floor cleaners. It has been linked to corroding hair follicles and impedes hair growth; it is a skin and eye irritant and can enhance allergic responses to other toxins and allergens. In severe cases it can cause blindness and depression.

Diethyl phthalate (DEP), dibutyl phthalate (DBP) and butyl paraben (BP) are man-made petroleum-based chemicals that are commonly found in lotions and creams. It has been found that the concentration of these compounds peaked in urine 8-12 hours after exposure. The highest concentration of DEP was found in nail polish, but over $\frac{3}{4}$ of the products tested showed measureable levels.⁶ The European Union has banned DBP, DEP and BP from use in cosmetics, but in Canada and the U.S. there are no restrictions on phthalates in cosmetics. Except for nail polish, phthalates are not generally listed as ingredients on labels because Canada's Cosmetic Regulations allow them to be included under the heading of “fragrance”.⁸

Other concerns about the chemicals commonly found in PCPs include:

- Medicated soaps that destroy the beneficial bacteria on the surface of the skin.
- Alcohol in products which contributes to skin dehydration. Some products, such as mouthwash, may contain even higher concentrations of alcohol than beer, wine or liquor. The continual use of alcohol-based mouthwash has been linked to an increased risk of oral and throat cancer. Alcohol shows low acute and repeat dose toxicity and is related to mild liver toxicity.⁶
- Oils in bathing products and moisturizers can clog the skin pores reducing perspiration and waste transport from the subcutaneous tissues.
- Petroleum-based ointments, such as Vaseline, coat the skin surface with an insulating and waterproof film which prevents evaporation of secretions and the release of heat. It also creates swelling on the top layer with a sustained hydration.

The pH Perspective

Many of the toxic chemicals in PCPs are acidic by nature. The concern with this is twofold. The first being, that when the pH of the body is disrupted it will pull minerals from nearby sources in order to balance the pH. The result is a weakening of the skin structure in response to the acid in the products. Another problem is if the pH of the PCPs is more acidic than the pH of the toxins it will cause the toxic acids transported in the skin surface to be transported back into the subcutaneous tissues. Effectively, many PCPs are both suppressive and toxic in their mechanism of action.

Historically, body care products were alkaline in nature and included compounds derived from wood and plant ash. It wasn't until about 1930 that a shift occurred and the idea of acid-based personal care products became fashionable.⁹ This change may have been due to the fact that when the pH of “skin mantle” was first measured it was believed to be around 6.0. Hence the belief was that acidic products were required to maintain the skin's integrity. Over time, the acidity of personal care products has become closer to a pH of 5.0 – 5.5, and as a result the pH of the “skin mantle” is often said to be between a pH of 4.5 and 5.5. Not only must chemical ingredients in skin care products be considered, but also the overall pH of a product.

PCPs that have a pH closer to 7.0 or above have been found to normalize the skin's dryness or oiliness, improve the removal of surface deposits such as cellulite, increase the skin's ability to detoxify and greatly improve skin itchiness and irritation, and to treat blemishes, black heads and acne. pH-balanced cosmetics can also improve the tone and texture of skin, improve skin healing and strengthen its resistance to pathogens. Alkaline PCPs work by increasing the permeability of the skin's pores, buffering the acids in the subcutaneous layer and aiding in detoxification.¹⁰

Considering only a small number of chemicals are tested for safety, and the challenges around the regulation and labelling of cosmetics, personal care products possess a great deal of potential to cause harm to human health. The solution is complex. It is of utmost importance that consumers learn to understand labels in detail in order to choose products that are pH-balanced and that contain few or no harmful chemicals. Supporting the health of the skin by encouraging alkaline body baths, dry skin brushing, regular exercise, adequate water, addressing underlying conditions and healthy skin hygiene are also beneficial. 🌿

About the Authors

Dr. Iva Lloyd is a naturopathic doctor, registered polarity educator and reiki master. In 2002 she founded Naturopathic Foundations, an integrated clinic with naturopathic doctors and other alternative health care providers that blend the naturopathic and energetic aspects of health care.

Dr. Lloyd teaches part-time at the Canadian College of Naturopathic Medicine. She is the author of four books: *Building a Successful Naturopathic Practice*, *Messages from the Body, a guide to the Energetics of health*, *The Energetics of Health, a naturopathic assessment and History of Naturopathic Medicine, A Canadian perspective*. Dr. Lloyd writes for various journals and magazines and gives seminars on naturopathic assessment, the integration of the mind and body, and the building blocks to health. She is current editor of the *Vital Link* and is Past-Chair of the board of the Canadian Association of Naturopathic Doctors. Dr. Lloyd is also the founder of www.ndhealthfacts.org i.lloyd@naturopathicfoundations.ca

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Skin care and Cosmetics Information Resources

Heavy Metal Hazard: The Health Risks of Hidden Heavy Metals in Face Makeup (Environmental Defence)
www.environmentaldefence.ca/reports/heavy-metal-hazard-health-risks-hidden-heavy-metals-in-face-makeup

The Just Beautiful Heavy Metals in Cosmetics Factsheet (Environmental Defence)
www.environmentaldefence.ca/reports/just-beautiful-heavy-metals-in-cosmetics-factsheet

The Just Beautiful Personal Care Products Pocket Shopping Guide (Environmental Defence)
www.environmentaldefence.ca/reports/just-beautiful-personal-care-products-pocket-shopping-guide

The Skin Deep Cosmetics Database (Environmental Working Group)
www.ewg.org/skindeep

Cosmetics Product and Ingredient Safety (U.S. Food and Drug Administration)
<http://www.fda.gov/Cosmetics/ProductandIngredientSafety/default.htm>

WHO booklet *Persistent Organic Pollutants: Impact on Child Health*:
http://www.who.int/ceh/publications/persistent_organic_pollutant/en/index.html