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# The art of male-specific skin care formulations

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*ABSTRACT: Even though men's skin shows the visible signs of aging more slowly than women's, men are significantly more at risk for conditions such as skin cancer and acne. The health of men's skin can be dramatically improved with the daily use of products formulated specifically for targeting the needs of men's skin. Cosmetically elegant, broad-spectrum sunscreens, effective oil control and acne products, and therapies for treating pseudofolliculitis barbae (PFB) and post-shaving irritation are all important product categories for the male patient. We will discuss the best-in-class ingredients and share ideas for successfully treating men's skin.*

## INTRODUCTION

Men's skin exhibits unique qualities that require proper formulation to achieve the best possible results. Males are more prone to skin cancer, acne and pseudofolliculitis barbae, and their skin may be inherently more inflamed due to daily grooming activities such as shaving. By examining the histological differences in men's skin, the formulator is able to develop simple, multipurpose products capable of combating these conditions and maintaining healthy skin.

## GENDER VARIANCES IN THE SKIN

Several studies demonstrate the distinct differences in male and female skin physiology (1-3, 8). Skin thickness, for example, is approximately 25 percent greater in men's skin than in women's. This variance is thought to be a result of increased collagen density due to elevated androgen production (4, 5). Studies also indicate that male sebum contains higher amounts of pore-clogging fatty acids than female sebum; this too is attributed to androgen hormones (6). Research on eccrine sweat glands indicates that, in most cases, men's sweat production is greater than women's (7). The pH of the skin also demonstrates differences from male to female. The pH of women's skin is an average of 5.6, while men's average pH is a more acidic 4.3 (8). Other scientific studies have led experts to believe they may have found a male-specific gene that causes chemical change and ultimately aggressive DNA mutation (9). It also should be noted that many epidermal and dermal components, such as skin hydration and barrier function, show no substantial variance between male and female test subjects (1, 8). Although studies are still somewhat

limited, legitimate progress has been made in distinguishing the physiological skin differences between sexes. These differences may explain why men are more prone to developing certain skin conditions.

## COMMON SKIN CONDITIONS IN MALES

A number of intrinsic and extrinsic factors contribute to a man's propensity toward specific skin concerns. The pathology of the skin conditions commonly seen in males and the gender-specific physiological contributors are key to product development. In addition, occupations and leisure activities should also be considered. The previously mentioned study which links DNA mutations to a Y chromosome gene shows promise in explaining the statistical findings that men are more prone to skin cancers (9). Regular participation in outdoor professions and/or leisure activities is likely to contribute to the belief that older males receive the largest cumulative amount of UV exposure of all age groups and both genders (10). Both of these factors are thought to substantially increase the risk of skin cancers in men. Acne is another common condition in males. Females have a tendency to suffer from breakouts throughout their lives, and males suffer primarily in the pubescent years with clearance by the early twenties. Male acne, however tends to be more severe (11). Sebum production, one of the main contributors to acne breakouts, is stimulated by androgen hormones both in male and female patients. Because of the surge of testosterone in males, oily skin and accompanying blemishes are seen regularly. The natural increase in sweat production in males may also contribute to the severity of acne lesions. Sweat has been shown to create local irritation, which in turn may contribute to the inflammatory component of acne (12). The combination of over-active sebaceous and sweat glands may be responsible for the prevalence and severity of acneic conditions in males. Regular shaving is also the source of certain inflammatory conditions such as irritation and pseudofolliculitis barbae, more commonly referred to as ingrown hairs. Men's facial hair is estimated to grow two millimetres per day (13) making shaving a necessity for most. The reoccurring exposure of the facial skin to the sharp razor creates a chronic source of irritation. Individuals with curly or wavy hair are more prone to pseudofolliculitis barbae. It occurs when a hair grows out from a curved follicle, and the hair curves back toward the skin. The tip then re-pierces the skin, leading to irritation, inflammation and sometimes infection (14).

Knowledge of the skin conditions that most commonly affect men will assist formulators in developing effective products for the male consumer.

**EFFICACIOUS INGREDIENTS AND FORMULATIONS IN THE TREATMENT OF MEN'S SKIN**

Industry professionals believe that several factors contribute to the success of male-specific skin care products: demand, texture, ease of use and most importantly, efficacy (13). It is thought that men shop for products with less emotional influence than women and have a higher demand for results. It is important to formulate products specific to the needs of men, focusing on the treatment of the aforementioned skin conditions and the maintenance of overall skin health. Several cosmetic and OTC topical ingredients have been clinically-proven to improve the health and appearance of the skin.

Prevention is the most critical component in the treatment of skin cancer. Daily use of broad-spectrum sunscreen products is imperative given the higher predisposition of men to the potentially deadly disease. In order for any sunscreen product to provide adequate protection it must protect from UVA and UVB radiation, both of which are thought to be responsible for skin cancer. Because there is no regulation regarding labelling for UVA protection, the only way to insure coverage for the entire UVA spectrum is to include at least one of the following ingredients: avobenzene, titanium dioxide, ecamsule (Mexoryl™), or zinc oxide. Luckily, the SPF number informs the consumer of UVB coverage. There are a number of categories of sunscreen agents that protect the skin from UVB rays including: salicylates, cinnamates and titanium dioxide (15). While there are many sunscreen agents to choose from, one is not necessarily more effective than the other. It is the formulation as a whole and patient compliance that determines a product's reliability. The compliance of men regarding daily use of products has been shown to be directly related to its texture and feel. Cosmetic elegance is critical for men; they will not use a product if they do not like it, no matter how effective it may be (13).

Although the pathology of acne and pseudofolliculitis barbae are different, the pathogenesis of follicular blockage and

inflammation call for similar treatment. Salicylic acid is a lipophilic molecule capable of penetrating through the sebum and debris within an impacted follicle. Its keratolytic action reduces corneocyte thickness, assisting in the release of trapped bacteria, oil and/or hair shafts. Salicylic acid also provides anti-inflammatory benefits to soothe the irritation often associated with breakouts and ingrown hairs (14, 20). Benzoyl peroxide (BPO) is an effective antimicrobial agent that has been used topically for decades. BPO works by delivering oxygen within the follicle to kill anaerobic bacterium. This antibacterial activity may also assist in alleviating pseudofolliculitis barbae-induced infection (14, 21). Retinoids are multifunctional ingredients that treat several dermatological conditions. The acceleration of cellular proliferation provided by retinoids reduces the occurrence of build-up within the follicle, benefiting both acne and pseudofolliculitis barbae. Retinoids have also been shown to reduce the amount of sebum produced, further assisting in the clearing of male acne (13, 22). Liquorice-derived licochalcone has demonstrated antibacterial effects. Liquorice extracts also provide anti-inflammatory benefits similar to cortisone (23) and inhibit lipase, an enzyme produced by the acne bacteria that causes local irritation (24). Daily application of alpha hydroxy acids (AHA) such as lactic, citric and glycolic acids has shown to be helpful in treating breakouts and PFB. AHAs work by encouraging desquamation and, in turn, loosening follicular debris (13, 14). By combining these ingredients, we are able to target the multiple contributors, thus ensuring optimal results.

**MULTIFUNCTIONAL PRODUCTS AND THE MALE CONSUMER**

Multifaceted products are particularly appealing to men. Products that provide more than one topical benefit significantly reduce the amount of time and effort required for daily use. These products form simplistic daily regimens and may contribute to compliance and repeat purchasing habits. Pairing ultraviolet (UV) protection with anti-inflammatory and hydrating components creates a protective and soothing daily product. Anti-inflammatory agents will help to calm the skin post-shave, without the discomfort of traditional after-shave products. Aloe vera is an excellent addition to men's formulations, as it offers both hydrating and anti-inflammatory benefits. Aloe is shown to reduce inflammation, increase blood flow and accelerate wound healing (16). Chamomile-derived bisabolol also acts as a potent soothing agent by inhibiting inflammatory enzymes (17). Topical panthenol, or vitamin B-5, offers hygroscopic properties along with anti-inflammatory benefits (18). Adding antioxidants such as retinol (vitamin A), ascorbic acid (vitamin C) and tocopherol (vitamin E) provides protection of the skin cells and the product's active ingredients from oxidation (19). These non-comedogenic ingredients create well-rounded products catered to a man's skin. Daily use of appropriate facial cleansers and nutritional topicals will help to preserve proper skin function. Gel cleansers are typically universally accepted





and may be used by most skin types. Cleansers should include mild surfactants for foaming properties and up to 5 percent alpha hydroxy acids for daily exfoliation. Humectant agents, such as glycerine and urea, are most effective because of their unique ability to pass through intracellular water channels, also known as aquaporins. This activity provides intense hydration within the skin cells (25). Cleansers should be pH balanced (4.0-5.0) to make application of toners optional or unnecessary, thus simplifying a man's potential routine. Nutritional topicals may include free radical quenching substances, such as green tea and/or grape extracts, which provide potent polyphenol antioxidants (26, 27). The inclusion of peptides may prevent the breakdown of collagen and other structural components (28). Skin-soothing ingredients, such as aloe vera, bisabolol and panthenol, as previously discussed, are also beneficial additions. Maintaining healthy skin may reduce the need for corrective products in the future.

## CONCLUSION

Formulation of male-marketed skin care products revolves around knowledge of the specific needs of men's skin. Men tend to prefer simple, results-oriented regimens that target their individual skin condition. The development of multipurpose formulations will reduce the number of products and the amount of time required for daily application. Formulating products with a light feel and efficacious ingredient blends will promote daily use and repeat purchases. Now that more information is available, it may particularly benefit research and development professionals to familiarize themselves with male skin physiology, commonly-seen conditions and scientifically-proven topical agents.

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