When Razor Meets Skin:

A Scientific Approach to Shaving

by Diana L. Howard, Ph. D.

As women it may be hard for us to relate to daily shaving of a facial beard but we all know the potential hazards of shaving our legs; be it cuts, nicks, ingrown hairs, or even an angry razor burn, we know the pitfalls associated with the shaving ritual. For men, besides having to deal with daily shaving, consideration for skin condition (i.e. oily or sensitized etc.) and beard type (i.e. coarse, fine, etc.) must also be taken into account. A recent survey conducted by The International Dermal Institute indicated that 79 percent of male respondents say they have "one or more skin problem(s) that I notice daily" and yet selection of their shaving products rarely takes this into account. Shaving can not only result in razor burn, ingrown hairs, and razor bumps, but it can lead to increased sensitization and inflammation that results in premature aging. Unfortunately, as the average man's beard grows two mm per day, there is ample opportunity to create an inflamed skin condition during shaving. As a matter of fact, if the average man starts shaving at 13 and continues until he is 85 years old. Assuming he spends all of five minutes shaving each day, he will devote over six months in his lifetime to just shaving his beard.

As professional skin therapists, we may not be shaving our clients but with the ever increasing number of men in the skin care center and spa, we need to be able to educate them about their specific skin care needs as it relates to shaving.

Problems Associated with Shaving

We know that the simple act of shaving imposes constant stress on the skin. Shaving is a form of physical exfoliation that can impact the health of the skin. Razor bumps, ingrown hairs, razor burn, and inflammation are just some of the visible signs of trauma that the skin endures when a razor is used on the beard. Shaving triggers a high level of visible irritation and can lead to overexfoliation, as well as a compromised lipid barrier. When the skin's lipid barrier is compromised, there is an increase in moisture loss, which leads to dry, scaly, cracked skin, and can ultimately lead to a sensitized skin condition.

Shaving Concerns That Affect Skin

A survey conducted by The International Dermal Institute indicates that the top three shaving concerns for men include:

1. Pseudofolliculitis Barbae

Pseudofolliculitis barbae includes ingrown hairs and razor bumps. Both of these skin conditions are prevalent in African American men or individuals with coarse, curly beard hairs. Studies have shown that the hair follicle on African American men is oriented more horizontal in the dermis rather than upright; when the hair grows with a kink or curl it winds around like a corkscrew, making it more likely to turn into the skin forming an ingrown hair. Ingrown hairs may also occur when the hair emerges from the follicle but grows back into the skin at an improper angle. The simple process of shaving the end of the hair can force the hair back into its follicle, or even cause the hair to double over on itself, re-entering the same follicle and growing inward instead of exiting the skin.

The body recognizes this ingrown hair as a foreign body (similar to the way it would a splinter), and triggers an inflammatory response that includes redness, itchiness, and a raised area that resembles a pimple that can fill with pus.

Razor bumps form when the hair emerges from the follicle and turns and enters an adjacent follicle. The skin responds similarly to an ingrown hair and often produces a keloidal tissue mass over the hair. This results in the characteristic razor bump.

To help prevent ingrown hairs and razor bumps, start by exfoliating with physical and chemical exfoliants prior to shaving. Physical exfoliants will help effectively exfoliate and prep the skin's surface removing excess stratum corneum cells that keep the hairs embedded in the tissue. Chemical exfoliants, including lactic acid and salicylic acid, will help remove dead skin cells, lift ingrown hairs above the skin line, and soften and smooth skin. Salicylic acid has the added benefit of being an anti-inflammatory agent which can help calm skin. Retinol (vitamin A) will also help gently exfoliate dulling skin cells from the skin's surface. For sensitized skin, use the exfoliant as part of the evening cleansing routine rather than directly before shaving. For best results, use a post-shave product with salicylic acid or willow bark, a natural source of salicylic acid, to help prevent ingrown hairs.

2. Razor Burn

Razor burn includes any nicks, scratches, and irritation associated with shaving. It occurs when skin is shaved too closely and too quickly, or when inadequate lubrication is used during shaving; it can occur when skin is shaved with a blunt blade, or when too much pressure is applied during shaving resulting in excess friction and irritation. It can also occur when shaving against the grain of the hair, or when shaving over already irritated or sensitized areas.

Razor burn is inflammation of the skin that we could classify as Irritant Contact Dermatitis. Irritant Contact Dermatitis is a reaction triggered by certain substances or ingredients, constant friction (razor against skin), or even water. The symptoms are burning, itching, stinging, and redness. Razor burn can be as mild as a few hours of discomfort and reddened skin or can last for days, resembling a rash or scratch

that remains inflamed. Razor burn can manifest into a serious problem if the irritation evolves into infected breakouts or blisters.

One of the means of protection that our epidermis relies upon is the lipid barrier layer that is part of the stratum corneum. This layer of lipids keeps moisture in the tissues and controls the entry of external chemicals from entering the deeper layers of the skin. During shaving, the barrier lipid layer can be compromised, especially if the man is in the habit of using alcohol laden aftershaves which can remove the lipids comprising this integral part of the stratum corneum. Once the barrier lipid layer is compromised, water readily escapes from the underlying tissues creating a dehydrated skin condition. Chemicals from the environment can now penetrate into the skin causing irritation and a sensitized skin condition. Once inflamed, anything can irritate the skin including daily shaving. In addition to all of the symptoms that a sensitized skin may experience, we now know that inflammation leads to premature skin aging which will undoubtedly also be a concern for the client.

Ingredients including wheat germ, yeast extract, vitamin E (tocopherol and its derivatives), soybean oil, shea butter, jojoba seed oil, evening primrose oil, and silicones will help protect the skin's natural barrier lipid layer, helping to combat irritation, reddening, and mechanical peeling associated with razor burn. Look for products with licorice, green tea, white tea, chamomile, aloe vera, panthenol, caffeine, bisabolol, comfrey, and allantoin to calm skin while promoting skin repair and fighting free radical damage.

3. Coarse, Heavy Beards

Depending upon genetics, ethnicity, and hormones, a male client may have a heavy or tough beard. Heavier beards are more challenging to shave, as the hair shaft offers more resistance, frequently clogs the razor, or the razor is not sharp enough to cut through the hair, causing painful scraping and tugging. As such, men with heavier beards are more likely to suffer from stinging, redness, nicks, and cuts.

In order to ease the discomfort associated with shaving a heavier beard, the beard must be softened, lifted, and the skin must be protected. Often products created for coarse beards focus only on softening the beard hairs to facilitate shaving; this is generally accomplished by using a high pH to soften the beard making it less resistant to the shave. Unfortunately, the alkaline pH can strip the barrier lipids from the skin, leaving skin taut, dry, and prone to sensitization. Look for products that contain humectants and conditioning agents to counter any dryness.

Ideally, look for a pre-shaving medium that is applied underneath a shaving cream that softens and lifts the beard while protecting the skin. It should provide a cushion between the razor and the skin. The mere application and massaging of a pre-shave medium onto the beard will help lift the beard hairs. Look for pre-shaving or shaving products that include camphor, a natural antiseptic that helps firm skin to lift the beard, clove flower oil, which helps open the pores while softening the beard to prevent scraping and tugging of the hair, glycerin and sodium hyaluronate to add additional lubricity and hydration during shaving, and soothing wheat germ extract and yeast extract to combat irritation and redness while reinforcing the barrier lipid layer.

Shaving the beard in the same direction as the hair shaft grows is often referred to as shaving with the grain. This is the desirable way to shave a beard in order to minimize irritation. Unfortunately, the direction of beard growth can be different all over the face, and will most likely be completely different on the neck making this a difficult task. Shaving against or across the grain will increase chances for irritation, redness, ingrown hairs, and razor burn. It is for this reason that it is so important to pay attention to the direction of beard growth.

If clients have a heavy, coarse beard, it is feasible for them to shave against the grain, but only after first shaving with the grain; after the first shave pass the hair is shorter and less likely to curl back in on itself minimizing chances for ingrown hairs. After the initial shave with the grain, however, the client must re-apply all necessary shaving mediums before shaving against the grain.

The pressure applied during the shave process is also critical to the prevention of nicks, cuts, razor burn,

irritation, and redness. Contrary to popular belief, applying too much pressure won't afford a closer shave; instead it will just facilitate the removal of skin cells, leading to razor burn or irritation. If the razor is sharp enough, minimal pressure will be sufficient for removing hair.

Male clients must understand that when selecting a shaving system, the effect of products on skin is just as important to consider as a preference for gel versus cream. And if they are truly looking to clear existing skin problems and maintain skin health in the most efficient method possible, it is necessary to consider more than just the shave step. Consideration for skin condition (i.e. sensitized, oily, etc.) as well as beard type (i.e. coarse, fine, etc.) should be taken into account when prescribing men's shave products.

The Three Steps of Shaving

The most important aspect of shaving is the pre-shave preparatory step. This step should prepare the beard and the skin for shaving while minimizing and preventing irritation, inflammation, and nicks. The pre-shave step is multi-functional: the first step is to thoroughly cleanse the skin ridding it of excess oils that coat the beard and skin; the cleanse step also must eliminate any bacteria that could cause infection should the skin be cut. Where ingrown hairs are an issue, exfoliation or a scrub is ideal as part of the pre-shave regimen. The pre-shave step should not only prep the beard for an adequate shave, but should protect the skin as well. The more the beard has been treated before meeting the razors edge, the easier it will be for the razor to slide over the skin. Wet shaving engorges the hair with water, softening it and reducing resistance to the blade which reduces trauma to the skin as well.

The next step is the actual shave. A man may select a shave medium, an oil, cream, or gel, based on personal preference but also bearing in mind his beard type (i.e. coarse) and skin condition (i.e. oily or sensitized skin). An oily skin man may prefer a gel over a cream or an oil, while a man with sensitized skin may opt for a cream. Regardless, the shaving medium should provide a lubricating cushion between the skin and the razor while providing a clean, close shave. It should lift and soften the beard but must continue to provide protection to the skin tissues.

The final step is the post-shave. Gone are the days that a man splashed alcohol on his face to remove the oily shave cream, close the pores, kill the bacteria, and subtly perfume the skin. Fragrance, especially delivered via alcohol, is a leading cause of contact

allergy in men and hyperpigmentation of the skin. More appropriately, post-shave products should calm the skin, treat inflammation, control ingrown hairs, help eliminate congestion of pores, and provide antioxidant and UV protection to the skin.

Newer post-shave balms reduce discomfort associated with shaving, while reducing redness (i.e. look for vaso-constricting caffeine) and irritation using botanical extracts (i.e. licorice, allantoin, aloe, chamomile, etc.) rich in polyphenols, and vitamins (i.e. panthenol, vitamin E, etc.) that speed the post-shave recovery time. They reinforce the barrier lipid layer with silicones and plant extracts (i.e. wheat germ, yeast extract, shea butter, etc.) to control and prevent sensitized skin while salicylic acid and willow bark extract are used to prevent ingrown hairs. Post-shave products also include skin treatment products for men that continue to calm and condition the skin but also treat it to fight skin aging; antioxidants (i.e. vitamins C and E) scavenge free radicals plus anti-enzyme agents (i.e. grape seed extract, licorice, etc.) inhibit enzymes that break down collagen while peptides stimulate new collagen synthesis. But most important, this aspect of the post-shave step must include a sunscreen.

A recent study by the Fox Chase Cancer Centre led by Elliot Coup concluded that men are less sun savvy than women and that they exhibit multiple high risk behaviors for getting skin cancer; namely, they do not use sunscreens. A research study conducted by Cancer Research UK voiced the same concern and added that men are less likely to use sunscreen and are not aware of the first signs of skin cancer; they are also less likely to seek medical treatment at the early stages of the disease. The incidence of skin cancer among men is rising rapidly and as professional skin therapists we must teach our male clients that using sunscreens is as fundamental to their grooming regimen as shaving.

Besides the beard, I am often asked what other differences are there between a woman's skin and a man's. From a structural point of view, there are a few

Is a Man's Skin Really Different?

differences that include skin thickness, collagen density, loss of collagen as we age, and texture. Let's look at each of these aspects in more detail.

We know that the thickness of the skin varies with the location, age, and sex of the individual. Androgen (i.e. testosterone) stimulation causes an increase in skin thickness, which accounts for why a man's skin is about 25 percent thicker than that of a woman's. While the benefit of having "a thicker skin" may be that it increases the resistance of the male skin, there probably isn't any benefit to this feature. As men age, there is a gradual thinning of the skin; this is in contrast to women where the thickness remains constant until about the fifth decade. After menopause, there is a significant thinning of the woman's skin which continues as she ages.

The physical signs of aging in adults, such as wrinkles and laxity to the tissue, are closely related to the collagen content of the skin. Both men and women lose about one percent of their collagen per year after their 30th birthday. For women, however, this escalates significantly in the first five years after menopause and then slows down to a loss of two percent per year.

Regardless of age, men have a higher collagen density than women; this is the ratio of collagen to the thickness of the skin. Researchers believe that the higher collagen density accounts for why women appear to age faster than men of the same age. When considering intrinsic (genetically programmed) aging of the skin, it has been said that women are about 15 years older than men of the same age. Of course, the role of daylight exposure in skin aging, combined with the fact that men do not use sunscreen as often as women, may account for why we do not readily notice. Extrinsic aging from UV radiation can add years to a man's skin and negate the benefit of slower intrinsic aging.

From a superficial perspective, the texture of a man's skin is very different than a woman's. The texture is rougher and the stratum corneum is thicker. There is also a difference in the composition of sebum and its production. After puberty, sebum production is greater in males than females which is attributed to androgen secretions and accounts for why men have longer lasting acne. The cells in a man's sebaceous glands have more positive receptors for androgens, which explains why they produce more sebum. Interestingly, redness, proliferation of the sebaceous glands, and swelling of the skin on the nose, (a condition known as rhinophyma, that is found in extreme cases of rosacea) is only seen in males. It is unknown if this condition is controlled by androgens in a similar capacity as sebum production.

Puberty also stimulates the appearance of facial hair in men and gives rise to sweat secretions. Males have more lactic acid in their sweat which accounts for a lower pH (0.5 lower) when compared to female sweat. Men also sweat more than twice as much as women and are more prone to sweating stimulated by an increase in body temperature. However, the male skin appears to be better hydrated than women's which is fortunate, as men are less likely to apply a hydrating moisturizer to their body or face. Perhaps the excess sweating and production of lactic acid, a known natural humectant for the skin, is responsible for the level of tissue hydration.

Once a man starts shaving regularly, the outer layers of the stratum corneum are subjected to forced exfoliation which induces an accelerated cell turnover and exposes cells that are not quite fully developed corneocytes to the environment. If the role of the stratum corneum is to protect the deeper skin tissues, then under-developed corneocytes are not fully functional skin cells, which may contribute to the problems many men face related to shaving and their skin condition.

Diana Howard Ph.D. has been in the cosmetic industry for 23 years. She earned her doctorate degree from The University of California Los Angeles where she specialized in plant biochemistry. Since then she has worked in research and development, as well as marketing for many of the major cosmetic companies. In addition, Howard was General Manager of the Leonard Drake Skin Care Centers where she developed the protocol required for opening and operating a successful skin care center. Howard has lectured extensively around the world sharing her knowledge of hair and skin research, ingredient technology, and business skills for achieving one's full business potential in the skin and spa industry. She is currently Vice President of Technical Development for The International Dermal Institute and Dermalogica.