

# Cosmetic Dermatologic Skin Care: The Essence of Our Training

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Most cosmetic dermatologists and patients would agree that many cosmetic procedures are performed to repair signs of extrinsic aging, namely actinic-induced aging, as well as intrinsic aging effects. Although many patients turn to surgical procedures or lasers, light peels, or microdermabrasion for ablative and nonablative rejuvenation, there is merit to the idea that a well-designed topical skin care regimen, in the right patient, yields results that parallel those achieved with more invasive procedures. Central to this idea are the choice and combination of products, as well as patient compliance with their proper use. In this article we detail topical skin care regimens and provide photographic documentation of the benefits of a well-designed daily regimen. As dermatologists, we are experts at maximizing the effects of topical skin care regimens, and we can use our skills to avoid unnecessary procedures and maintain or enhance the effects of procedures.

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The number of patients seeking cosmetic dermatologic services is increasing as patients realize that they want to continue to look good while they are living longer and healthier lives. It is imperative that we address their concerns in both a clinically effective and cost-effective manner. Patients are inundated with consumer reports touting the latest in lasers and microdermabrasion procedures. Although there is validity in using some of these tools, we encourage all dermatologists to first institute a well-designed topical skin care regimen.

One reason for this approach comes from the experience of S. Obagi, MD, in treating patients who have had cosmetic surgery. We have found that to cultivate a growing population of cosmetic patients, you must first build your reputation and earn their trust. Patients need to know that when they come to your office they will receive a medical approach to their care that they

will not get from aesthetic centers. We see many patients who have spent a small fortune at aesthetic centers only to present with persistent acne, melasma, and photo-damage. These patients are rightfully frustrated.

Another reason is that a well-designed topical skin care regimen serves several purposes. It often achieves results equal to or better than those achieved with noninvasive lasers and microdermabrasion procedures. Furthermore, starting a well-designed regimen before lasers or microdermabrasion yields better results with these modalities and maintains these results long-term.

To build trust with our patients and differentiate ourselves from aesthetic centers, we capitalize on our dermatology training to formulate a regimen that is tailored for each patient. We offer all patients, whose needs range from leg vein consultations to face-lifts, a detailed topical skin care regimen to enhance their appearance. We emphasize that this is a skin care regimen; we do not prescribe the agents in the regimen one at a time. We have seen many frustrated patients who state they have tried retinoids, hydroquinone, or  $\alpha$ -hydroxy acids. These patients failed to see improvement not because of the topical agents themselves but because the agents were prescribed in the incorrect combination or were applied using an incorrect quantity.

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**INITIAL CONSULTATION GOALS**

The goals of a topical skin care regimen are to reverse actinic damage; slow the aging process by increasing collagen, elastin, and glycosaminoglycans; minimize subsequent oxidative damage<sup>1</sup>; and address any disease states (eg, acne or melasma). At the initial consultation, we ask that all patients wash off any makeup so that we can make a thorough assessment. We use a well-lit room for the consultation, and we keep a handheld mirror in the room so that we may note skin irregularities or defects for patients. We also have an album containing photographs of patients with various skin conditions taken before and after using a well-designed topical skin care regimen.

We take time to explain our philosophy to patients and encourage them to actively participate in the antiaging topical skin care regimen. Once we complete the initial consultation, the medical assistants or aestheticians on staff explain the proper use of the regimen. We provide patients with written instructions on how to use the agents in the regimen and what reactions they can expect. We tell patients that our goal is to return their skin to its normal, healthy state.<sup>1,2</sup>

**TOPICAL SKIN CARE AGENTS**

A well-designed topical skin care regimen (Tables 1 and 2) should include a combination of the following: a retinoid, a keratolytic agent (in the appropriate setting), a bleaching agent (if needed), and an antioxidant. Because preventing further damage is key, we incorporate daily photoprotection into a regimen.

**Retinoids**

Aside from their use in treating acne and psoriasis, topical synthetic retinoids may be viewed as the workhorse of any skin care regimen. Retinoids bind to 2 distinct families of nuclear receptors, RAR and RXR, to affect transcription of genes essential for growth, differentiation, and maintenance of epidermal tissues. There are 3 generations of synthetic retinoids. The first includes tretinoin and isotretinoin; the second, acitretin and etretinate; and the third, adapalene, bexarotene, and tazarotene. Although many of these agents have been used for cosmetic purposes, most literature on skin rejuvenation supports the safety and efficacy of tretinoin, which is our recommendation.<sup>3,4</sup>

Retinoids have both epidermal and dermal effects. They help build collagen and normalize the life cycle of keratinocytes. In the epidermis, retinoids may decrease keratinocyte atypia and aid in even dispersion of melanosomes. Dermal effects of retinoids include increased collagen, elastin, and glycosaminoglycan production. Retinoids also lead to decreased activities of enzymes involved in collagen breakdown. However, the beneficial effects of retinoids are dependent on both concentration and volume; therefore, it is critical that patients apply both the right percentage and the right amount of the product. Without proper instruction, most patients stop using retinoids once they experience the initial retinoid dermatitis.

Patients must be educated on properly using tretinoin. We recommend that patients begin with tretinoin 0.05% cream (1 g, or ≈1-in line of product) applied nightly to

<b>TABLE 1</b>	
<b>Common Topical Skin Care Regimen Showing the Order in Which the Agents Are Applied*</b>	
<b>Morning</b>	<b>Evening</b>
Wash	Wash
Toner <sup>†</sup>	Toner <sup>†</sup>
4–6 drops vitamin C 10%–20% serum to entire face	1 g hydroquinone 2%–4% cream <sup>‡</sup>
1 g hydroquinone 2%–4% cream <sup>‡</sup> ; extra applied to dark areas	1 g tretinoin
1 g α-hydroxy agent <sup>§</sup>	
Broad-spectrum sunblock SPF 30 or higher	

\*SPF indicates sun protection factor.  
<sup>†</sup>For oily or acne-prone skin.  
<sup>‡</sup>For use in patients with dyschromia.  
<sup>§</sup>For use in patients with acne or melasma and patients who are peeling excessively.

TABLE 2

## Summary of Topical Skin Care Agents Used and the Clinical Goal of Using Them\*

Topical Agent	Clinical Goal
Retinoids	Increase collagen, elastin, GAG production Normalize keratinocyte maturation and proliferation Normalize distribution of melanosomes within keratinocytes
Keratolytics	Enhance penetration of other topical agents Improve acne Give skin a smoother feel
Bleaching agents	Even skin tone, melasma, and lentigines
Antioxidants	Protect DNA of keratinocytes Minimize collagen breakdown
Photoprotection	Minimizes keratinocyte damage Reduces photo-induced collagen and elastin breakdown

\*GAG indicates glycosaminoglycan.

the entire face, including the lower eyelids, and feathered onto the neck. The backs of the hands may be treated nightly as well. The upper eyelids, neck, and chest should be treated once or twice per week. Patients should expect mild erythema and scaling initially, which should subside within 6 to 8 weeks. As patients become satisfied with the clinical outcome, they may decrease the frequency of application to 3 times per week as part of a maintenance regimen or continue using the product nightly (recommended). Although most likely safe, retinoids should not be used in patients who are pregnant; tretinoin is a pregnancy category C drug, and tazarotene is a category X drug. All patients starting on retinoid therapy will be more photosensitive for approximately 3 months while the stratum corneum is thinnest, but this should subside with time.<sup>1,5</sup> We recommend that patients continue retinoid therapy even during summer.

### Keratolytic Agents

Keratolytic agents include all of the  $\alpha$ -hydroxy acids, phytic acid, and salicylic acid. They create a smooth feel to the skin by breaking up keratinocyte adhesion in the stratum corneum and the very upper epidermis. This breakup is also how they beneficially affect acne. Additionally, keratolytic agents may enhance tretinoin and hydroquinone penetration through their disruption of the stratum corneum. Patients need to be educated on when to apply such agents to avoid interfering or deactivating the biologic effect of the retinoid. Retinoids may be deac-

tivated by simultaneous application of low-pH  $\alpha$ -hydroxy acids, so these agents are best applied in the morning along with a sunblock.<sup>6</sup>

Patients are instructed to apply the  $\alpha$ -hydroxy acid to the entire face except the upper eyelids. The patient should expect a slight degree of stinging on application. The clinical efficacy of keratolytic agents depends on their pH and concentration, especially with  $\alpha$ -hydroxy acids. Most patients tolerate  $\alpha$ -hydroxy acid 6% or salicylic acid 2% to start and may, if clinically indicated, be moved gradually to a higher dose. For nonfacial skin, lactic acid cream in concentrations of up to 12% may be used without undue irritation.

### Bleaching Agents

Bleaching agents, such as hydroquinone and azelaic acid, are essential to patients with melasma or other forms of dyspigmentation.<sup>7</sup> Hydroquinone is an important pre-procedure conditioning agent for reducing the post-inflammatory hyperpigmentation in at-risk patients.<sup>2</sup> Side effects, notably photosensitivity and exogenous ochronosis, are important considerations when selecting patients. A rare side effect in the United States, ochronosis is seen more often in patients of African or Hispanic ancestry and in patients who have used hydroquinone in concentrations of at least 6%.

Azelaic acid works by inhibiting tyrosinase. In addition to its effects on pigmentation, azelaic acid has been shown to be efficacious in treating patients with acne and

rosacea.<sup>8</sup> Kojic acid is another tyrosinase inhibitor; however, its use has fallen out of favor because of its propensity to sensitize and induce contact dermatitis.

We have found hydroquinone 4% to be a safe, well-tolerated agent. Since its half-life is 12 hours, it is applied to the face twice daily. Patients are instructed to apply 1 g to the entire face and then apply a little bit more to the areas of darkest pigmentation. The agent should also be feathered along the jawline and onto the neck to avoid demarcation lines.

### Antioxidants

Antioxidants are believed to prevent free radical damage, which has been associated with photoaging and carcinogenesis.<sup>9</sup> Vitamins C (ascorbic acid) and E (alpha-tocopherol) and other polyphenols have become popular within the cosmeceutical industry, and a growing body of evidence supports their use.<sup>10</sup> Antioxidants such as vitamins C and E are believed to protect the skin from UV radiation-induced damage. Water-soluble vitamin C protects the aqueous environment; lipid-soluble vitamin E protects membranes. Vitamin C is found in much greater concentrations than other antioxidants in the skin. Photodamaged and photoaged skin exhibits a markedly decreased expression of vitamin C. In addition to its antioxidant effects, vitamin C is a necessary cofactor for enzymes involved in collagen synthesis. It has been found to inhibit tyrosinase and lighten areas of hyperpigmentation. Other known benefits include promotion of collagen synthesis, protection from UV radiation, and improvement in various inflammatory skin conditions.<sup>10</sup> Vitamin C may also reduce post-laser resurfacing erythema.<sup>11</sup> Although plants and animals are capable of synthesizing vitamin C, humans lack the enzyme necessary for its synthesis and must acquire it from their diets.<sup>10,12</sup> Dietary supplementation is not the magic bullet, as topical application is much more efficient than ingestion for achieving high concentrations in the skin. Therefore, it seems logical to include vitamin C in topical antiaging skin care regimens, and the evidence supports its use as a topical photoprotective and antioxidant agent.<sup>13</sup> We start our patients with vitamin C 10% serum and increase to 20% as tolerated. However, the formulation must be in a serum (not a cream), stabilized against oxidation, and must contain the L-ascorbic acid form of vitamin C. Patients are instructed to apply 4 to 6 drops of the serum to the face, including the upper and lower eyelids, after cleansing.

The evidence supporting vitamin E is less convincing.<sup>12,14,15</sup> Although data suggest that vitamin E is a promising antioxidant, the temperature-stable esterified forms (which are inactive) may not be bioconverted into active forms in the skin. Dosing and delivery are therefore not clear. Ade-

quate randomized, controlled trials have not yet addressed these issues. Vitamin E may also cause contact dermatitis, and it has been speculated that the esterified forms of vitamin E may even participate in carcinogenic pathways.<sup>15</sup>

While the search continues for an antiaging pill, ingestible botanicals such as green tea and resveratrol have gained popularity.<sup>16-18</sup> Resveratrol is a polyphenolic phytoalexin found in the skin and seeds of grapes and in nuts. It has become well known as a cardioprotective antioxidant. Mouse studies have shown promising results in protection from UVB radiation-induced photodamage; however, these studies have yet to be substantiated by human studies.

### PHOTOPROTECTION

Photoprotection is critical to skin health. Recent advances in sunblock technology have made photoprotection easier and more cosmetically appealing than ever.<sup>19</sup> In fact, the elegance of these newer sunblocks allows them to replace moisturizers for almost all patients.

UV radiation is divided into UVA, UVB, and UVC. UVC is absorbed by the ozone layer and does not reach the earth. Sunlight exposes us to UVB (290–320 nm), UVA2 (320–340 nm), and UVA1 (340–400 nm) wavelengths. UVA radiation is more abundant than UVB. Sunblocks traditionally are labeled with a sun protection factor, which is largely a measure of UVB protection. UVB radiation directly damages DNA and leads to highly mutagenic cyclobutane-pyrimidine dimers and pyrimidine-pyrimidone (6-4) photoproducts, which are implicated in the pathogenesis of basal cell and squamous cell carcinomas. The mutagenic effects of UVA radiation are believed to be mediated through the generation of reactive oxygen species. Because UVA radiation has a longer wavelength than UVB, it penetrates more deeply and thus contributes to dermal photoaging.

Zinc oxide and titanium dioxide are the gold standards for photoprotection. These agents are chemically inert and therefore less irritating and less allergenic. Furthermore, they are photostable, thus not degrading quickly upon UV exposure. They work by reflecting UV radiation from the skin. Although older formulations of zinc oxide and titanium dioxide left an opaque white coating on the skin, newer, micronized formulations are more cosmetically elegant.

Newer chemical sunblocks use a combination of UVA and UVB filters. One such combination is avobenzone (UVA filter) and oxybenzone (UVB filter). UVA radiation has proven more difficult to filter because of the instability of UVA-filtering agents. Avobenzone, which filters long-wavelength (340–400 nm) UVA radiation, is photolabile. Photostabilizers such as diethylhexyl 2,6-naphthalate may be added to enhance the stability of UVA filters.




Figure not available online

**Figure 1.** Patient with severe melasma of 20 years' duration before (A) and 3 months after (B) using a well-designed topical skin care regimen.

Newer agents such as ecamsule provide coverage through short-wavelength (320–340 nm) UVA radiation. When used in formulations containing octocrylene and a type of photostabilized avobenzone, such agents provide complete broad-spectrum UV coverage.

Because of the damaging effects of UV radiation, all topical skin care regimens should include a broad-spectrum sunblock applied each morning regardless of the time of year. It is up to the physician to recommend a specific sunblock that is tailored to each patient. The physician must suggest which sunblocks are moisturizing, which will not cause acne, and which will not leave an opaque white coating on the skin.

We recommend that a sunblock become the patient's moisturizer rather than a moisturizer containing a small amount of sunblock. We tell our patients to apply sunblock before makeup and make sure it is applied to the face, neck, exposed areas of the chest, and backs of the hands.

## CASE REPORTS

### Patient 1

Patient 1 presented for consultation for recalcitrant melasma of 20 years' duration. She had tried many topical skin care agents without improvement and was inquiring about laser or peel options. As part of our discussion, we talked about using a topical skin care regi-

men to prepare her skin for any resurfacing procedure. However, we did tell her that she should see improvement in her skin with the topical skin care regimen alone. She broke down in tears when she heard that she had to start another topical skin care regimen; however, with the encouragement of our staff and her husband, she gave the regimen a chance. The regimen consisted of tretinoin 0.1% (1 g nightly), hydroquinone 4% (twice daily), glycolic acid 6% lotion (every morning), and a physical sunblock (daily). Figure 1 shows her at baseline and after 3 months of using this topical skin care regimen with dramatic improvement in her melasma. She was extremely happy. We will maintain this regimen for 1 year before weaning off the bleaching agents to ensure adequate suppression of overactive melanocytes.

### Patient 2

Patient 2 presented with extensive photodamage and melasma. At her initial consultation, we instituted a topical skin care regimen identical to that of patient 1 except that we included tretinoin 0.05% instead of 0.1%. She was receiving botulinum toxin type A injections during this year as well. Figure 2 shows her at baseline and after 1 year of using this topical skin care regimen.

Although such remarkable results may argue against

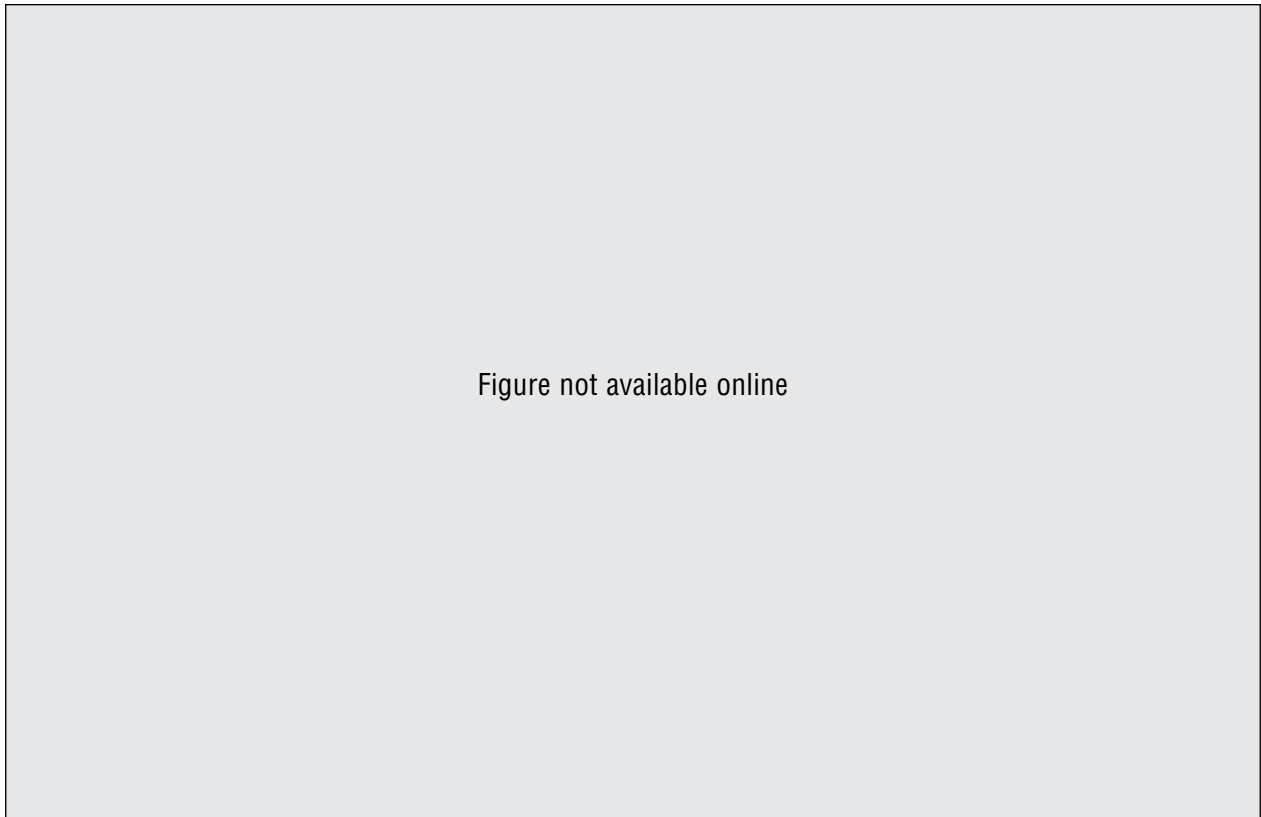


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**Figure 2.** Patient with photodamage and melasma before (A) and 1 year after (B) using a topical skin care regimen and receiving botulinum toxin type A injections.

more invasive procedures, one must realize that not all patients' expectations can be met with topical skin care regimens alone, especially those patients with extensive actinic damage or deep scarring. Therefore, there will always be a need for lasers, peels, and microdermabrasion; however, these procedures should not be the first line of treatment.

### SUMMARY

By beginning with topical skin care regimens, patients will become more comfortable and confident in your abilities as a dermatologist and may be even more willing to undergo more invasive procedures as time progresses. Also, offering a medical approach to antiaging of the skin helps to differentiate us from aesthetic centers, where medical supervision may be lacking.

A well-designed topical skin care regimen is the cornerstone of cosmetic dermatology. Regardless of their goals and expectations, all patients must adhere to a well-designed topical skin care regimen both before and after cosmetic procedures and for lifelong skin health. Since we, as dermatologists, know how to manipulate the cells that make up the epidermis and dermis, we are the skin care experts and must not be quick to replace our knowledge with the latest skin-rejuvenation system.

### REFERENCES

1. Obagi S, Bridenstine JB. Lifetime skincare. *J Oral Maxillofac Surg.* 2000;12:531-540.
2. Obagi S, Bridenstine JB. Chemical skin resurfacing. *J Oral Maxillofac Surg.* 2000;12:541-553.
3. Bhawan J. Short- and long-term histologic effects of topical tretinoin on photodamaged skin. *Int J Dermatol.* 1998;37:286-292.
4. Bhawan J, Olsen E, Lufrano L, et al. Histologic evaluation of the long term effects of tretinoin on photodamaged skin. *J Dermatol Sci.* 1996;11:177-182.
5. Kligman AM. Guidelines for the use of topical tretinoin (Retin-A) for photoaged skin. *J Am Acad Dermatol.* 1989;21:650-654.
6. Ditre CM, Griffin TD, Murphy GF, et al. Effects of alpha-hydroxy acids on photoaged skin: a pilot clinical, histologic, and ultrastructural study. *J Am Acad Dermatol.* 1996;34:187-195.
7. Engasser PG, Maibach HI. Cosmetic and dermatology: bleaching creams. *J Am Acad Dermatol.* 1981;5:143-147.
8. van Zuuren EJ, Gupta AK, Gover MD, et al. Systematic review of rosacea treatments. *J Am Acad Dermatol.* 2007;56:107-115.
9. Pinnell SR. Cutaneous photodamage, oxidative stress, and topical antioxidant protection. *J Am Acad Dermatol.* 2003;48:1-19.
10. Farris PK. Topical vitamin C: a useful agent for treating photoaging and other dermatologic conditions. *Dermatol Surg.* 2005;31:814-817.
11. Alster TS, West TB. Effect of topical vitamin C on postoperative carbon dioxide laser resurfacing erythema. *Dermatol Surg.* 1998;24:331-334.
12. Lin JY, Selim MA, Shea CR, et al. UV photoprotection by combination topical antioxidants vitamin C and vitamin E. *J Am Acad Dermatol.* 2003;48:866-874.
13. Humbert PG, Haftek M, Creidi P. Topical ascorbic acid on photoaged skin. Clinical, topographical and ultrastructural evaluation:

- double-blind study vs. placebo. *Exp Dermatol*. 2003;12:237-244.
14. Thiele JJ, Hsieh SN, Ekanayake-Mudiyanselage S. Vitamin E: critical review of its current use in cosmetic and clinical dermatology. *Dermatol Surg*. 2005;31:805-813.
  15. Konger RL. A new wrinkle on topical vitamin E and photo-inflammation: mechanistic studies of a hydrophilic gamma-tocopherol derivative compared with alpha-tocopherol. *J Invest Dermatol*. 2006;126:1447-1449.
  16. Afaq F, Mukhtar H. Botanical antioxidants in the prevention of photocarcinogenesis and photoaging. *Exp Dermatol*. 2006;15:678-684.
  17. Blagosklonny MV. An anti-aging drug today: from senescence-promoting genes to anti-aging pill. *Drug Discovery Today*. 2007;12:218-224.
  18. Baur JA, Sinclair DA. Therapeutic potential of resveratrol: the in vivo evidence. *Nat Rev Drug Disc*. 2006;5:493-506.
  19. Lim HW, Draelos ZD, Rigel DS, et al. Shedding light on complete UV protection. *Cosmet Dermatol*. 2006;19(suppl 5):3-8. ■



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