

A SUPPLEMENT TO

JOURNAL OF DRUGS IN DERMATOLOGY

JDD

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DRUGS • DEVICES • METHODS

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INCORPORATING COSMECEUTICALS  
IN IN-OFFICE AESTHETIC PROCEDURES  
FOR SKIN OF COLOR

This supplement to the *Journal of Drugs in Dermatology* was supported by  
an independent educational grant from SkinCeuticals.

## Breaking Barriers: Advancing Cosmeceuticals and Integrated Skincare for Skin of Color – Based on a Medscape Online Activity

Release Date: April 1, 2025

Expiration: April 1, 2026

### Target Audience

This activity is intended for a US-based audience of primary care physicians, nurses, nurse practitioners, physician assistants, pharmacists, dermatologists, plastic surgery, and aesthetic medicine specialists.

### Goal Statement

The goal of this activity is for healthcare professionals to have increased knowledge of the science behind cosmeceuticals in skincare products, key ingredients, and antioxidants to better equip them to recommend appropriate integrated skincare regimens to their diverse patients as a routine practice via real patient cases. Learners will also have increased confidence in individualizing skin care for patients with skin of color.

### Learning Objectives

Participant Learning Objectives Relate To:

- Increased knowledge regarding the:
  - Assessment of skincare needs of ethnically diverse patient populations
  - Key components of skin protection to cover the entire spectrum of environmental aggressors
  - Clinical data on cosmeceuticals as a component of integrated skincare
- Greater competence associated with:
  - Recommending appropriate pre- and intraprocedural integrated skincare regimens to diverse patients
  - Recommending appropriate post-procedural integrated skincare regimens to diverse patients
- Greater confidence in their ability to
  - Effectively communicate with ethnically diverse patient populations regarding their skincare needs

### Supporter

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# Breaking Barriers: Advancing Cosmeceuticals and Integrated Skincare for Skin of Color

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## ABSTRACT

Common signs of skin aging include wrinkles, fine lines, and pigmentary disorders. Patients with skin of color present with unique dermatologic challenges due to differences in how skin conditions manifest on darker skin tones, such as melasma and post-inflammatory hyperpigmentation. As a result, dermatologists and aestheticians need to be aware of these concerns and how to adequately address them. Many prescription and over-the-counter topical medications are now available to treat patients' dermatologic conditions. By combining such treatments with in-office physical therapies, an integrated approach to patient skincare is now possible. Therefore, clinicians should be aware of available comprehensive skincare approaches that can be tailored to the individual aesthetic concerns and skin health needs of their patients.

*J Drugs Dermatol.* 2025;24:4(Suppl 1):s5-10.

## Common Conditions in Skin of Color

Wrinkles, sagging, and pigmentation issues—inevitable skin changes indicative of the aging process—can occur in patients of any skin tone. However, hyperpigmentation skin conditions, such as post-inflammatory hyperpigmentation (PIH) and melasma, are particularly concerning for patients with skin of color (SOC) due to the appearance of dark spots and patches on the skin.<sup>1,2</sup> Photoaging is another common cause of hyperpigmentation in individuals with SOC. While certain signs of aging may be delayed by 10 to 20 years in Black patients compared with those with lighter skin, alterations in skin quality—such as wrinkles/deep expression lines, periorbital and perioral subcutaneous volume loss, and skin laxity—become more noticeable in SOC as patients age.<sup>3-6</sup>

## Factors Influencing the Aging of Skin

Factors that influence the aging of skin include both intrinsic and extrinsic factors. Intrinsic factors that contribute to aging skin include biological and physiological differences between dark and light skin.<sup>1,2</sup> For example, the stratum corneum in Black skin appears to have a greater degree of layering that contributes to its more compact and cohesive nature.<sup>4,6-8</sup> Accordingly, increased stratum corneum compactness may lessen skin fragility and susceptibility to sun damage, consistent with the finding that 5 times

more ultraviolet (UV) light reaches the upper dermis in White skin compared with SOC.<sup>9</sup> As a result, this may contribute to the delay in visible signs of skin aging commonly seen in Black individuals compared with those with lighter skin. Other intrinsic factors include genetics, cellular metabolism, and hormonal changes.<sup>10</sup>

Extrinsic factors that influence the aging process of the skin include exposure to blue light, UV light, environmental pollutants, smoking, and poor nutrition and physical activity, which can contribute to coarse wrinkles, loss of elasticity, laxity, and the development of a rough-textured appearance.<sup>11-13</sup> Other external factors include the negative effects of stress on skin aging, and sleep deprivation.<sup>10,11</sup>

## Aging Skin: Prevention

Modifying factors contributing to the aging process is critical for patients as this can significantly change self-perception and impact psychosocial wellness. Individuals who look younger may feel younger and, as a result, feel healthier overall.<sup>5,11</sup> This supports the observation that aged skin is associated with one's nutritional status and poorer health and disease, serving as an aesthetic measure reflecting a person's general health and vitality.<sup>5</sup>

In a recent observational, cross-sectional, online survey of women (N = 1646) in the United States, participants were asked about perceptions of representation in skin aging prevention information.<sup>14</sup> An important finding was that, among women of color (Blacks, Asians), some of the most important features of skin aging include fine lines and wrinkles, laxity (sagging), poor texture, and dyspigmentation (brown discoloration).<sup>14</sup> Therefore, the implementation of skincare strategies aimed at mitigating the consequences of photoaging is of paramount importance to patients with SOC.

### Ethnic and Racial Differences in Skin of Color

#### *Skin Type Approximation Scales*

Dermatologic conditions may manifest differently in SOC, and dermatologists need to consider skin tone when making clinical assessments and treatment choices for patients with SOC. The Fitzpatrick skin classification scale is the most widely used scale to classify skin color. In the original iteration of the Fitzpatrick Skin Type (FST) scale, 6 different skin types (I-VI) were included and used to understand how different doses of UV light therapy cause tanning or burning of skin in patients with psoriasis.<sup>15-17</sup> However, the FST is associated with several limitations. The effects of UV light irradiation may not be accurately captured or appear differently on darker shades of skin, and this system was largely based on patients with lighter skin colors (FST I, II, III, and IV). Consequently, other scales that are more inclusive of all skin tones and types have been developed.<sup>17-19</sup>

An update of the Fitzpatrick classification was recently undertaken to address SOC and is named the Skin Color and Ethnicity Scale.<sup>20</sup> In this proposed scale, features of skin that can be used to define skin type are included such as freckling and wrinkling. This scale also seeks to help clinicians define the risk of scarring and PIH in different skin types following a dermatologic procedure.<sup>20</sup> Therefore, this scale may help guide clinicians in selecting appropriate cosmetic and surgical procedures for their patients. However, consensus-based initiatives to foster the development of validated and reliable tools remain an unmet need in the dermatologic care of patients with SOC.<sup>21</sup> Clinicians should be aware that many competing skin tone classification scales exist that offer varying benefits to clinicians in assessing skin, and that there is no one universally accepted scale that is both comprehensive and easy to use.

### General Skincare Needs for Patients With Skin of Color

#### *Photoprotection*

Patients with SOC can achieve their skincare goals by first addressing their general skincare needs. Clinicians can recommend sunscreens, which have several benefits, including shielding the skin from harmful rays, preventing skin discolorations, reducing the risk of developing skin malignancy, and reducing the effects of skin aging.<sup>22</sup> Photoprotection in individuals with SOC should be recommended, including use of broad-spectrum sunscreen with a

sun protection factor (SPF)  $\geq 30$  at 2 mg/cm<sup>2</sup>, applied 15 min before sun exposure and every 2 hours thereafter. Tinted sunscreens based on nonmicronized inorganic filters should be used for protection against UV and visible light.<sup>22</sup> For patients with SOC who wish to avoid sunscreen that causes a white cast, a nanosized inorganic filter (with zinc oxide or titanium oxide) or organic filter-based sunscreen may be desired, due to their transparent formulations (less visible upon application).<sup>22-25</sup> However, these sunscreens protect only against UV irradiation, not visible light. It is also important to counsel patients on the need to wear hats, sunglasses, and other sun-protective clothing (preferably with an ultraviolet protection factor [UPF]  $\geq 40$ ), and to avoid sun exposure during peak daylight hours to reduce the short- and long-term effects of photoaging.<sup>22</sup>







#### *Anti-Aging Care*

In addition to sunscreen products, several agents can be used to combat the effects of photoaging and other skin concerns. Agents that may be useful in combatting the signs of aging include antioxidants, which protect against reactive oxygen species (ROS) and UV radiation; metal-chelating agents, which protect against environmental pollutants; peptides/growth factors, which enhance skin firmness and reduction in fine lines; and lipids/ceramides, which promote skin barrier health.<sup>26-34</sup> The latter may be of particular interest for patients with darker skin tones since ceramides have been reported to be lower in patients of African descent vs other racial/ethnic groups.<sup>7</sup> Topical retinoids can also be applied to target signs of aging, including fine lines and changes to skin texture.<sup>4,26,35</sup> Glycation inhibitors are an emerging class of novel compounds that are actively being studied for their ability to avert the toxic accumulation of intracellular molecular entities known as advanced glycation end-products (AGEs), which have been implicated in the pathobiology of aging and other chronic metabolic diseases (eg, cardiovascular, diabetes).<sup>33,36,37</sup>

#### *Addressing Hyperpigmentation*

Agents used to treat hyperpigmentation disorders include tyrosinase inhibitors and melanosome transfer inhibitors.<sup>38,39</sup> The use of the tyrosinase inhibitor, hydroquinone, has historically been a first-line recommended approach for managing hyperpigmentation and melasma.<sup>40,41</sup> However, clinicians should be aware that even brief use of hydroquinone can result in serious or harmful skin side effects such as exogenous ochronosis, skin rash, and facial swelling.<sup>40,41</sup> In light of this, the US Food and Drug Administration (FDA) has issued a warning letter concerning the use of products containing hydroquinone.<sup>42</sup> Accordingly, safer alternatives to hydroquinone are available in dermatology practice and should be considered. These include compounds with moderate to strong evidence, such as cysteamine and tranexamic acid. Other agents have been studied, albeit with weaker/limited clinical evidence, due to various problems including small trial size, poorly designed studies, and safety issues.<sup>38,43</sup>

**FIGURE 1.** Skin type and tanning ability according to the updated Fitzpatrick classification scale.<sup>20</sup>

|            |   |  |   |
|------------|---|--|---|
| <b>I</b>   |    | <ul style="list-style-type: none"> <li>▪ Burns frequently, rarely tans</li> <li>▪ Freckling</li> <li>▪ Wrinkles</li> <li>▪ Deep lines</li> <li>▪ Truncal nevi</li> </ul>                   | <ul style="list-style-type: none"> <li>▪ No Palmar/plantar nevi</li> <li>▪ No restrictions with lasers or peels including deep peels</li> <li>▪ Rare keloid tendency</li> <li>▪ Post inflammatory erythema more likely than PIH</li> </ul>        |
| <b>II</b>  |    | <ul style="list-style-type: none"> <li>▪ Occasionally burns, can tan</li> <li>▪ Freckling</li> <li>▪ Wrinkles</li> <li>▪ Deep lines and solar elastosis</li> </ul>                         | <ul style="list-style-type: none"> <li>▪ Truncal nevi</li> <li>▪ No Palmar/plantar nevi</li> <li>▪ No restrictions with lasers or peels including deep peels</li> </ul>   |
| <b>III</b> |    | <ul style="list-style-type: none"> <li>▪ Tans more than burns</li> <li>▪ Freckling</li> <li>▪ Fine wrinkles</li> <li>▪ Etched in lines in the upper face</li> </ul>                        | <ul style="list-style-type: none"> <li>▪ GH on the chest and legs</li> <li>▪ Truncal nevi</li> <li>▪ No Palmar/plantar nevi</li> <li>▪ Care with peels and lasers</li> </ul>  |
| <b>IVa</b> |   | <ul style="list-style-type: none"> <li>▪ Tan, rarely burns</li> <li>▪ Freckling</li> <li>▪ Fine wrinkles</li> <li>▪ Etched in line in upper face</li> </ul>                                | <ul style="list-style-type: none"> <li>▪ Fewer truncal nevi</li> <li>▪ Labial lentigos</li> <li>▪ Occasional palmar/plantar nevi</li> <li>▪ Care with medium peels</li> <li>▪ Caution with lasers</li> <li>▪ Beware of keloid scarring</li> </ul> |
| <b>IVb</b> |  | <ul style="list-style-type: none"> <li>▪ Tan</li> <li>▪ Freckling</li> <li>▪ Fine wrinkles</li> <li>▪ Etched in line in upper face</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Minimal truncal nevi</li> <li>▪ Labial lentigos</li> <li>▪ Palmar/plantar nevi</li> <li>▪ Caution with medium peels</li> <li>▪ Caution with lasers</li> <li>▪ Beware of keloid scarring</li> </ul>       |
| <b>Va</b>  |  | <ul style="list-style-type: none"> <li>▪ Tans easily</li> <li>▪ Etched in line in upper face</li> <li>▪ Minimal truncal nevi</li> <li>▪ Labial lentigos</li> </ul>                         | <ul style="list-style-type: none"> <li>▪ Palmar/plantar nevi</li> <li>▪ Caution with medium peels</li> <li>▪ Warning with lasers</li> <li>▪ Beware of keloid scarring</li> </ul>  |
| <b>Vb</b>  |  | <ul style="list-style-type: none"> <li>▪ Tans easily</li> <li>▪ Features if VI but may have reactive dyschromia like a Va</li> <li>▪ May have etched in lines in the upper face</li> </ul> | <ul style="list-style-type: none"> <li>▪ No truncal nevi</li> <li>▪ Labial lentigos</li> <li>▪ Palmar/plantar nevi</li> <li>▪ Warning with medium peels</li> <li>▪ Warning with lasers</li> <li>▪ Beware of keloid scarring</li> </ul>            |
| <b>VI</b>  |  | <ul style="list-style-type: none"> <li>▪ Tans easily</li> <li>▪ Reactive dyschromia likely</li> <li>▪ May have etched in lines in the upper face</li> <li>▪ No truncal nevi</li> </ul>     | <ul style="list-style-type: none"> <li>▪ May have labial lentigos or mottled lip pigmentation</li> <li>▪ Palmar/plantar nevi</li> <li>▪ Warning with medium peels</li> <li>▪ Warning with lasers</li> </ul>                                       |

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Coleman W, Mariwalla K, Grimes P. Updating the Fitzpatrick classification: the skin color and ethnicity scale. *Dermatologic Surgery*. 2023;49(8):725-731.



**Integrated Skincare: Significance and Strategies for Skin of Color**

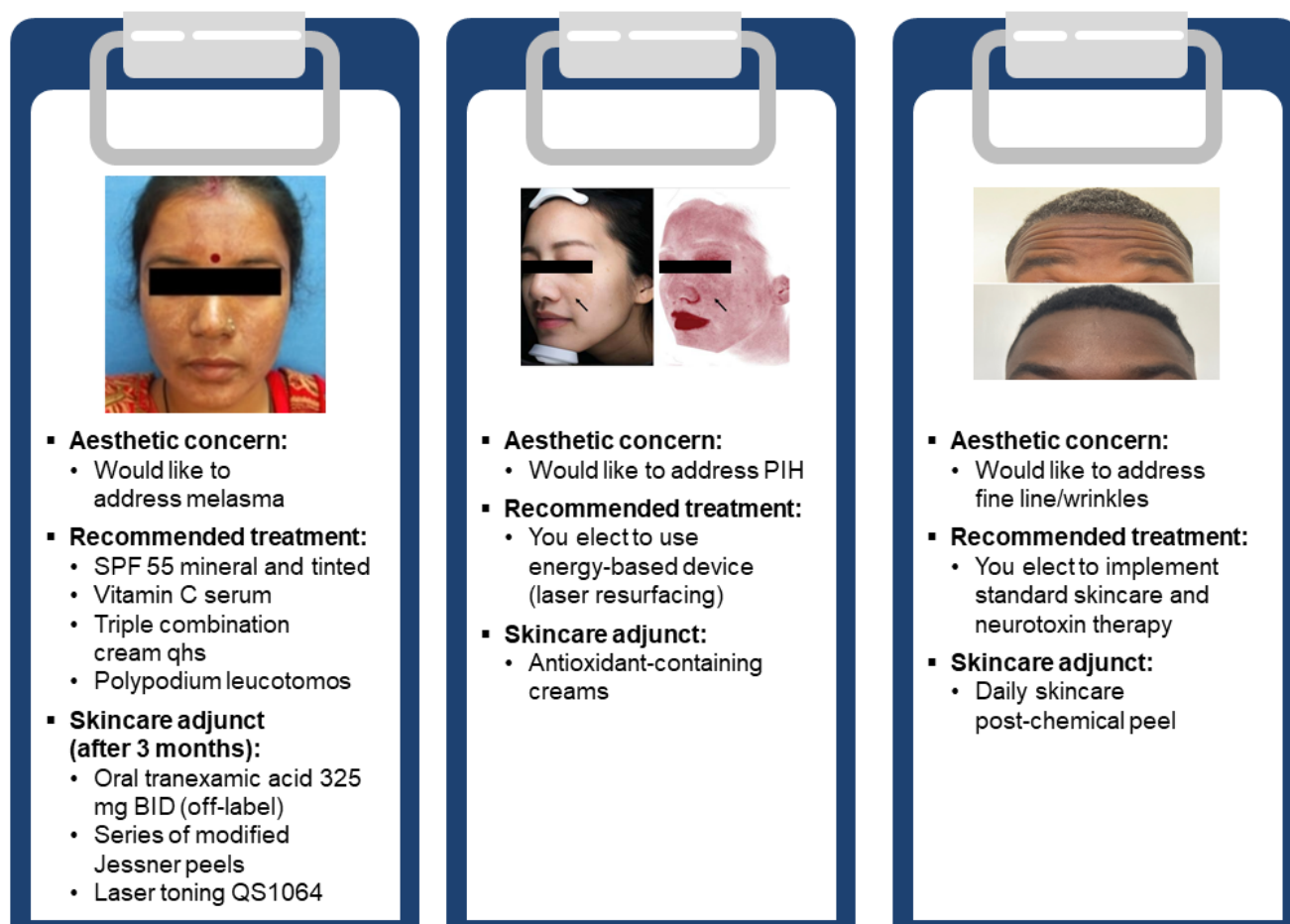
Based on individual concerns and goals of the patient, a multi-pronged approach to skincare may be warranted. This can best be accomplished using an integrated skincare strategy that incorporates a combination of chemical and physical procedures (Figure 2), which may include microdermabrasion, laser treatments, and chemical peels.<sup>44-47</sup> Additionally, the skincare agents highlighted above are of germane interest to patients with skin of color, not only in the context of addressing daily cosmetic problems, but also for preprocedure and postprocedure management.<sup>1,4,46-48</sup> This is especially important for preventing exacerbation of preexisting skin conditions, such as hyperpigmentation and signs of aging. In this context, it is important that treatment be spaced apart or milder protocols be selected to prevent overstimulation or over-exposure, which can cause irritation or deep desquamation.<sup>4,47,48</sup>

Creating a comprehensive skincare regimen can help clinicians provide patients with the positive outcomes they strive to achieve. This is supported by the goals of integrated skincare, which aims to<sup>51-55</sup>:

- Reduce postprocedure downtime
- Decrease patient healing time
- Improve patient satisfaction
- Enhance procedure outcomes

To help patients reach their desired skin quality, clinicians can recommend moisturizers after chemical peels, the latter of which can be readily performed using alpha-, beta-, and polyhydroxy acid-based regimens.<sup>54,56</sup> Antioxidants may be employed to speed up recovery following an energy-based device procedure, while topical regimens can benefit patients who have undergone facial

**FIGURE 2.** The integrated approach to managing common aesthetic concerns in patients with skin of color.<sup>49,50</sup>



BID, twice daily.

Third image courtesy of Dr DiAnne Davis MD.



rejuvenation (eg, submental fat reduction) with injectables (eg, deoxycholic acid injection).<sup>52,54,55</sup> Patients can also try light-emitting diode face masks (photobiomodulation therapy) in the comfort of their homes, which helps create even skin tone and texture to address aesthetic concerns such as inflammatory acne, fine wrinkles, scars, and photoaged skin.<sup>57,58</sup> Independent of the strategy used, careful selection of appropriate adjunctive skincare, timing, dosing, and formulation to optimize nonsurgical outcomes is key to successful treatment.<sup>4,48</sup>

### Clinical Pearls and Key Takeaways for the Clinician

Clinicians should partner with their patients with SOC to develop a comprehensive treatment plan that addresses all aspects of skincare. This includes combining multiple approaches ranging from topical agents and prescribed therapies to in-office procedures and medical devices that can safely be used at home.<sup>4,48</sup> When insurance coverage is a limiting factor, patients should have confidence in knowing that over-the-counter alternatives exist to meet their skincare needs (eg, treat hyperpigmentation).<sup>43</sup> Lastly, due to the implementation of multiple treatment modalities along with their safety concerns, dermatologic care should be provided under the guidance of a medical expert such as a dermatologist, or a highly trained skin aesthetician and other professionals (eg, nurse practitioners, physician assistants) involved in the skincare of patients.<sup>59,60</sup>

### DISCLOSURES

Jared Jagdeo MD MS has the following relevant financial relationships: Consultant or advisor for Clinical Skin; L'Oréal; Omnilux; Sun Pharmaceutical Industries, Ltd. Speaker or member of speakers bureau for Sanofi/ egeneron. Research funding from: Allergan/AbbVie Inc.; Sun Pharmaceutical Industries, Ltd. Dr Jagdeo received an honorarium from Medscape, LLC, for authorship of this educational activity.

**Commercial Supporter:** Supported by an independent educational grant from SkinCeuticals.

### REFERENCES

- Woolery-Lloyd HC. Individual article: Skincare in skin of color: a comprehensive approach to preprocedure, in-traprocedure, and postprocedure. *J Drugs Dermatol*. 2024;23(8):62041s5-62041s10.
- Fernández-Varela-Gómez F, Sandoval-García A, Cabrera-Rios KV. Signs of skin aging: a review. *Int J Res Med Sci*. 2024;12(7):2674.
- Vashi NA, De Castro Maymone MB, Kundu RV. Aging differences in ethnic skin. *J Clin Aesthet Dermatol*. 2016;9:31-38.
- Quiñonez RL, Agbai ON, Burgess CM, et al. An update on cosmetic procedures in people of color. Part 1: Scientific background, assessment, preprocedure preparation. *J Am Acad Dermatol*. 2022;86(4):715-725.
- Humphrey S, Manson Brown S, Cross SJ, et al. Defining skin quality: clinical relevance, terminology, and assessment. *Dermatol Surg*. 2021;47(7):974-981.
- Alexis AF, Grimes P, Boyd C, et al. Racial and ethnic differences in self-assessed facial aging in women: results from a multinational study. *Dermatol Surg*. 2019;45(12):1635-1648.
- Sugino K, Imokawa G, Maibach HI. Ethnic difference of varied stratum corneum function in relation to stratum corneum lipids. *J Dermatol Sci*. 1993;6(1):108.
- Weigand DA, Haygood C, Gaylor JR. Cell layers and density of Negro and Caucasian stratum corneum. *J Invest Dermatol*. 1974;62(6):563-568.
- Kaidbey KH, Agin PP, Sayre RM, et al. Photoprotection by melanin—a comparison of black and Caucasian skin. *J Am Acad Dermatol*. 1979;1(3):249-260.
- Knaggs H, Lephart ED. Enhancing skin anti-aging through healthy lifestyle factors. *Cosmetics*. 2023;10(5):142.
- Griffiths TW, Watson REB, Langton AK. Skin ageing and topical rejuvenation strategies. *Br J Dermatol*. 2023;189(suppl 1):i17-i23.
- Coats JG, Maktabi B, Abou-Dahech MS, et al. Blue light protection, part I-effects of blue light on the skin. *J Cosmet Dermatol*. 2021;20(3):714-717.
- Zhang S, Duan E. Fighting against skin aging: the way from bench to bedside. *Cell Transplant*. 2018;27(5):729-738.
- Callender VD, Harvey VM, Hartman CL, et al. Do women with skin of color think they are well represented in skin aging prevention information? *J Clin Aesthet Dermatol*. 2024;17(4):18-22.
- Fitzpatrick TB. The validity and practicality of sun-reactive skin types I through VI. *Arch Dermatol*. 1988;124(6):869-871.
- Santiago S, Brown R, Shao K, et al. Modified Fitzpatrick scale-skin color and reactivity. *J Drugs Dermatol*. 2023;22(7):641-646.
- Ly BCK, Dyer EB, Feig JL, et al. Research techniques made simple: cutaneous colorimetry: a reliable technique for objective skin color measurement. *J Invest Dermatol*. 2020;140(1):3-12.e1.
- Subedi SK, Ganor O. Considerations for the use of Fitzpatrick skin type in plastic surgery research. *Plast Reconstr Surg Glob Open*. 2024;12(6):e5866.
- Goon P, Banfield C, Bello O, et al. Skin cancers in skin types IV-VI: does the Fitzpatrick scale give a false sense of security? *Skin Health Dis*. 2021;1(3):e40.
- Coleman W, Mariwalla K, Grimes P. Updating the Fitzpatrick classification the skin color and ethnicity scale. *Dermatol Surg*. 2023;49(8):725-731.
- Harvey VM, Alexis A, Okeke CAV, et al. Integrating skin color assessments into clinical practice and research: a re-view of current approaches. *J Am Acad Dermatol*. Published online February 9, 2024. doi:10.1016/j.jaad.2024.01.067
- Tsai J, Chien AL. Photoprotection for skin of color. *Am J Clin Dermatol*. 2022;23(2):195-205.
- Schneider SL, Lim HW. A review of inorganic UV filters zinc oxide and titanium dioxide. *Photodermatol Photoimmunol Photomed*. 2019;35(6):442-446.
- Skin of Color Society. A guide to sunscreen selection. Accessed October 14, 2024. <https://skinofcoloursociety.org/patient-dermatology-education/guide-sunscreen-selection/>
- Jesus A, Mota S, Torres A, et al. Antioxidants in sunscreens: which and what for? *Antioxidants (Basel)*. 2023;12(1):138.
- Motamedi M, Chehade A, Sanghera R, et al. A clinician's guide to topical retinoids. *J Cutan Med Surg*. 2022;26(1):71-78.
- Valacchi G, Pecorelli A, Belmonte G, et al. Protective effects of topical vitamin c compound mixtures against ozone-induced damage in human skin. *J Invest Dermatol*. 2017;137(6):1373-1375.

28. Ferrara F, Woodby B, Pecorelli A, et al. Additive effect of combined pollutants to UV induced skin oxinflammation damage. Evaluating the protective topical application of a cosmeceutical mixture formulation. *Redox Biol.* 2020;34:101481.
29. Oresajo C, Pillai S, Manco M, et al. Antioxidants and the skin: understanding formulation and efficacy. *Dermatol Ther.* 2012;25(3):252-259.
30. Pambianchi E, Ferrara F, Pecorelli A, et al. Deferoxamine treatment improves antioxidant cosmeceutical formulation protection against cutaneous diesel engine exhaust exposure. *Antioxidants (Basel).* 2021;10(12):1928.
31. Draelos ZD. The science behind skin care: moisturizers. *J Cosmet Dermatol.* 2018;17(2):138-144.
32. Wan DC, Wong VW, Longaker MT, et al. Moisturizing different racial skin types. *J Clin Aesthet Dermatol.* 2014;7(6):25-32.
33. Chen CY, Zhang JQ, Li L, et al. Advanced glycation end products in the skin: molecular mechanisms, methods of measurement, and inhibitory pathways. *Front Med (Lausanne).* 2022;9:837222.
34. Husein El Hadmed H, Castillo RF. Cosmeceuticals: peptides, proteins, and growth factors. *J Cosmet Dermatol.* 2016;15(4):514-519.
35. Searle T, Al-Niaimi F, Ali FR. The top 10 cosmeceuticals for facial hyperpigmentation. *Dermatol Ther.* 2020;33(6):e14095.
36. Song Q, Liu J, Dong L, et al. Novel advances in inhibiting advanced glycation end product formation using natural compounds. *Biomed Pharmacother.* 2021;140:111750.
37. Twarda-Clapa A, Olczak A, Białkowska AM, et al. Advanced glycation end-products (AGEs): formation, chemistry, classification, receptors, and diseases related to AGEs. *Cells.* 2022;11(8):1312.
38. Juhasz MLV, Levin MK. The role of systemic treatments for skin lightening. *J Cosmet Dermatol.* 2018;17(6):1144-1157.
39. Nautiyal A, Wairkar S. Management of hyperpigmentation: current treatments and emerging therapies. *Pigment Cell Melanoma Res.* 2021;34(6):1000-1014.
40. Desai SR, Alexis AF, Elbuluk N, et al. Best practices in the treatment of melasma with a focus on patients with skin of color. *J Am Acad Dermatol.* 2024;90(2):269-279.
41. Lazar M, De La Garza H, Vashi NA. Exogenous ochronosis: characterizing a rare disorder in skin of color. *J Clin Med.* 2023;12(13):4341.
42. FDA website. FDA works to protect consumers from potentially harmful OTC skin lightening products. FDA Drug Safety and Availability. Available at: <https://www.fda.gov/drugs/drug-safety-and-availability/fda-works-protect-consumers-potentially-harmful-otc-skin-lightening-products>. Accessed December 18, 2024.
43. Jafry M, Guan LL, Mohammad TF. A practical guide to over-the-counter treatments for hyperpigmentation. *JEADV Clinical Practice.* 2024;1-15.
44. Ding Y, Zhang C, Xiang LF. Application of integrated skincare in medical aesthetics: a literature review. *J Eur Acad Dermatol Venereol.* 2024;38(suppl 6):5-16.
45. Desai M, Gill J, Luke J. Cosmetic procedures in patients with skin of color: clinical pearls and pitfalls. *J Clin Aesthet Dermatol.* 2023;16(3):37-40.
46. Amechi M, Halpin J. Considerations for laser therapy, microneedling, and chemical peels when treating patients with skin of color. *Plast Aesthet Nurs (Phila).* 2023;43(1):14-21.
47. Harnchoowong S, Vachiramon V, Jurairattanaporn N. Cosmetic considerations in dark-skinned patients. *Clin Cosmet Investig Dermatol.* 2024;17:259-277.
48. Quiñonez RL, Agbai ON, Burgess CM, et al. An update on cosmetic procedures in people of color. Part 2: neuromodulators, soft tissue augmentation, chemexfoliating agents, and laser hair reduction. *J Am Acad Dermatol.* 2022;86(4):729-739.
49. Khunger N, Kandhari R, Singh A, et al. A clinical, dermoscopic, histopathological and immunohistochemical study of melasma and facial pigmentary demarcation lines in the skin of color. *Dermatol Ther.* 2020;33(6):e14515.
50. Masub N, Nguyen JK, Austin E, et al. The vascular component of melasma: a systematic review of laboratory, diagnostic, and therapeutic evidence. *Dermatol Surg.* 2020;46(12):1642-1650.
51. Lupo M, Jacob L. Cosmeceuticals for enhancing cosmetic procedures. In: Lupo M, et al. *Cosmeceuticals and Cosmetic Practice.* Wiley online library; 2013. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118384824.ch28>. Accessed August 28, 2024.
52. Waibel JS, Mi QS, Ozog D, et al. Laser-assisted delivery of vitamin c, vitamin e, and ferulic acid formula serum decreases fractional laser postoperative recovery by increased beta fibroblast growth factor expression. *Lasers Surg Med.* 2016;48(3):238-244.
53. Machado BHB, Frame J, Zhang J, et al. Comparative study on the outcome of periorbital wrinkles treated with laser-assisted delivery of vitamin c or vitamin c plus growth factors: a randomized, double-blind, clinical trial. *Aesthetic Plast Surg.* 2021;45(3):1020-1032.
54. Bruce S, Roberts W, Teller C, et al. The effects of a daily skincare regimen on maintaining the benefits obtained from previous chemical resurfacing treatments. *J Drugs Dermatol.* 2016;15(9):1145-1150.
55. Dayan SH, Bacos JT, Ho TT, Gandhi ND, et al. Topical skin therapies in subjects undergoing full facial rejuvenation. *J Cosmet Dermatol.* 2019;18(3):798-805.
56. Ladenheim LA, Marmur ES. Cosmeceuticals using alpha, beta, and polyhydroxy acids. In: *Cosmeceuticals.* Karger Publishers; 2021:20-25.
57. Tran VV, Chae M, Moon JY, et al. Light emitting diodes technology-based photobiomodulation therapy (PBMT) for dermatology and aesthetics: recent applications, challenges, and perspectives. *Optics & Laser Technology.* 2021;135:106698.
58. Bu P, Duan R, Luo J, et al. Development of home beauty devices for facial rejuvenation: establishment of efficacy evaluation system. *Clin Cosmet Investig Dermatol.* 2024;17:553-563.
59. Griffith CF, Young PA, Hooker RS, et al. Characteristics of physician associates/assistants in dermatology. *Arch Dermatol Res.* 2023;315(7):2027-2033.
60. Aleisa A, Lu JT, Al Saud A, et al. The differences in the practice of cosmetic dermatologic procedures between physicians and nonphysicians. *Dermatol Surg.* 2023;49(12):1165-1169.

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