

# Aesthetician Role in Facial Plastic Surgery and Systemic Therapy for Healthy Skin



Anya Costeloe, DO<sup>a,b,c,\*</sup>, James Newman, MD<sup>a</sup>

## KEYWORDS

- Aesthetician • Esthetician • Facial plastic surgery • Skin care • Cosmetic surgery • Nutraceuticals
- Vitamins • Systemic therapy

## KEY POINTS

- Aestheticians play an important role in facial plastic surgery offices and are an integral part of the care team.
- Aestheticians may assist in the pre- and post-operative care of surgical patients, as well as perform skin care consultations, superficial peels, microdermabrasion, lymphatic massage, dermaplaning, waxing, semi-permanent make-up and other procedures based on specific state laws.
- Regulations on the scope of practice of aestheticians vary widely across states.
- Nutraceuticals are a growing market and as facial plastic surgeons we must educate ourselves on the research and the science behind them.

## INTRODUCTION

Aestheticians play an important role in the facial plastic surgeon's office from skin analysis, treatments, early detection of neoplasms, postoperative care from many of the treatments described in this book. They also survey the holistic traditions and explosive array of cosmeceuticals which are constantly changing and help keep us all informed about what many of our patients perceive as good skin maintenance. While there are some comparative standards for the training and certification of aestheticians, we explore the current spectrum of training via interviews with practices across the United States. We also survey the tools and technologies with which aestheticians are able to help our patients achieve optimal skin maintenance.

With the boom of the aesthetic industry, increased life expectancy and the normalization of receiving aesthetic treatment, procedures, and surgeries, facial plastic surgeons are often struggling

to have enough time to fulfill patient needs. Aestheticians can complement a busy facial plastic surgery practice by helping in the pre- and post-operative care of patients as well as with skin care and maintenance appointments.

Per the ASCP (Association of Skin Care Professionals), an aesthetician is a skincare professional who focuses on the health and beauty of the skin.<sup>1</sup> Estheticians often work in spas, salons, and resorts, or are self-employed. They may work with clients of all ages and skin types and may specialize in specific areas, such as acne treatment, anti-aging, or eyelash and eyebrow treatments. The role of an aesthetician is to help clients improve the appearance and health of their skin. However, the specific role of the aesthetician working in facial plastic surgery practice varies from practice to practice and from state to state. Some of this variability is due to differences in state laws regarding the scope of practice of aestheticians.

<sup>a</sup> Premier Plastic Surgery, 1795 El Camino Real Suite 200, Palo Alto, CA 94306, USA; <sup>b</sup> The Maas Clinic;

<sup>c</sup> California Pacific Heights Medical Center

\* Corresponding author. 1001 4th Street, Southwest Washington, DC 20024

E-mail address: anyacosteloe@gmail.com

## TRAINING AND SCOPE OF PRACTICE

Esthetician training and certification requirements vary greatly by state as shown in **Table 1**. While some states have state-specific exams, many states use the National-Interstate Council on State Boards of Cosmetology (NIC) practical and/or written examination. The National Esthetics Practical Examination consists of a section on scientific concepts and a section on esthetics practice. The esthetics practice of the exam covers cleansing and steaming the face, facial makeup, facial mask, hair removal of the eyebrows, manual extraction of the forehead, massaging the face, setup and client protection and so forth.<sup>1</sup>

There are a handful of states (Washington, Virginia, Utah, District of Columbia) that utilize a two tier esthetician licensing system. Estheticians are able to obtain additional training and take the National Advanced Esthetics Practical Examination (NCEA) to be designated as a “master esthetician,” and NCEA-certified. This is the highest skin credential available in the United States and means the esthetician has met the competency standards of the NCEA 1200 hour esthetician job task analysis.<sup>2</sup> The advanced exam covers additional subjects including manual lymphatic drainage, ultrasonic exfoliation treatment, chemical peels, particle microdermabrasion, facial treatment with LED, electricity and electrical equipment, and body treatments such as dry exfoliation and mud mask.

## METHODS

Seven states were chosen to represent various regions of the United States. These included California, District of Columbia, Florida, Michigan, New York, Oregon and Texas. The scope of practice and role of aestheticians within facial plastic surgery practices was surveyed in each state by interviewing aestheticians who were employed in facial plastic surgery practices. A questionnaire was created to determine each esthetician’s scope of practice and role, their training and their approach to specific skin concerns. State cosmetology boards were contacted for information was found on their website to find state-specific regulations on esthetician’s scope of practice, training requirements, license requirements, and any recent changes in legislation.

## RESULTS

Training and state regulations on the esthetician’s scope of practice vary widely across the country. California has some of the more

restrictive regulations while Texas and Michigan allow aestheticians the ability to operate laser devices. Training requirements and state-specific regulations on the scope of practice of aestheticians are shown in **Tables 1** and **2**.

## CALIFORNIA

In California (CA), aestheticians are licensed by the California Board of Barbering and Cosmetology and are not allowed to perform medical procedures or diagnose or treat medical conditions. Aestheticians can be hired by a physician to perform non-medical procedures including facials and skin treatments such as microdermabrasion, as long as it is only affecting the outermost layer of the skin, the stratum corneum. Aestheticians may not use lasers or intense pulsed light devices under any circumstance in the state of CA. They are also not allowed to perform microneedling because it penetrates the skin and in a 2016 update on regulation, microneedling was categorized as a medical treatment.<sup>3,4</sup> The most recent update on regulation regarding esthetician is the California Senate Bill 803 that was passed in January 2022. It decreased the barbering and cosmetology programs to 1,000 hours from 1,500 and 1,600 hours and added dermaplaning to the scope of practice for cosmetologists and aestheticians and eyelash and eyebrow perms to the scope of practice for aestheticians.<sup>5</sup>

Unlike aestheticians, medical assistants are regulated by the Medical Board of California. However, they are considered “unlicensed persons” and therefore, are not permitted to perform diagnostic tasks or duties that are invasive or require patient assessment. Overall, the physician is responsible for the appropriate utilization of the medical assistant. A medical assistant can undergo training and licensing by one of the board-approved organizations (American Association of Medical Assistants, American Medical Certification Association, American Medical Technologists, California Certifying Board of Medical Assistants, Multiskilled Medical Certification Institute, Inc.) or receive training from a physician, podiatrist, physician assistant, nurse practitioner or nurse midwife.

A medical assistant is not permitted to perform invasive cosmetic procedures such as microneedling or dermabrasion. However, with the appropriate training, they are able to draw blood and perform skin tests. According to Cal. Code Regs. tit. 16 § 1366.1, a medical assistant can administer medications by intramuscular, subcutaneous, and intradermal injection, perform skin tests, and perform venipuncture to withdraw blood if they

**Table 1**  
**Aesthetician training and prerequisites by state**

State	Prerequisites	Training	Renewal	Continuing Education (CEU)	Governing Organization
CA	16 yrs old, 10th grade or equivalent	1000 hrs, written & practical exams	Every 2 yrs, \$50	None	California Board of Barbering and Cosmetology
DC	16 yrs old, 10th grade	1500 hrs; 2-tier licensing system: basic esthetician and master esthetician licenses	Every 2 years	6hrs every 2 yrs	DC Board of Barber and Cosmetology
FL	16 yrs old, high school diploma or equivalent	260 hrs, written exam	Every 2 yrs, \$55	16 hrs every 2 yrs	Florida Department of Business and Professional Regulation
MI	17 yrs old, 9th grade	400 hrs (6 month apprenticeship)	Every 2 yrs, \$48	None	Michigan Department of Licensing & Regulatory Affairs – Cosmetology Department
NY	17 yrs old, Certificate from a physician stating the individual is free from communicable diseases	600 hrs, written & practical exams	Every 4 yrs, \$40	None	New York Division of Licensing Services- Esthetics
OR	16 yrs old, 8th grade	250 hrs, 150 hrs in safety & infection control, 100 hrs career development, written & practical exams	Every 2 yrs, \$40	None, instructor license: 30 hrs every 36 mo	Oregon Health Authority - Board of Cosmetology
TX	17 yrs old, high school diploma or GED	750 hrs, written & practical exams	Every 2 yrs, \$50	Speciality Operator License: 4 department approved hours; Instructor License: 6 hours	Texas Department of Licensing & Regulation - Board of Cosmetology

complete minimum training requirements of ten hours of training in the specific procedure and satisfactory of performance of 10 of these procedures.<sup>6</sup> The training must be supervised by a physician or instructor.

## FLORIDA

New regulations passed in 2021 limiting the scope of practice of aestheticians. They can no longer perform any service that perforates the skin or

**Table 2**  
Aesthetician scope of practice by state

State	Lasers	Microneedling	Injectables	Noninvasive Procedures <sup>a</sup>
CA	No	No	No	Yes with additional training
DC	Yes if master esthetician	No (can't penetrate past stratum corneum epidermis)	No	Yes with advanced esthetic training certificate
FL	No	No	No	No
MI	Yes	Yes	Unclear	Yes
NY	Yes	No	No	Yes with additional training
OR	No	No	No	Most with advanced esthetic training certificate
TX	Yes	Yes	Under physician supervision	Yes

<sup>a</sup> i.e. noninvasive body contouring, cryolipolysis, noninvasive ultrasound technology, noninvasive radiofrequency technology.

use FDA-approved medical devices. This includes microneedling, laser, pulsed light, ultrasound skin-care, radiation skincare, plasma pen or Hyaluron pen services, injections, permanent makeup, and microblading.<sup>7-8</sup>

## NEW YORK

New York is one of the few states where there are no limitations on who can operate a laser.<sup>9</sup> However, a new bill that mandates state-approved training, examinations, and continuing certification by an accredited industry group for laser hair removal technicians was proposed in March 2021 and is currently in assembly.<sup>10</sup> Another bill was recently referred to the House Committee on economic development in January 2023 that would allow aestheticians to perform microneedling after completing a five hour course.<sup>11</sup>

## OREGON

Based on the rule passed by the Oregon Board of Cosmetology in 2019, aestheticians are not permitted to perform advanced nonablative esthetics, which is defined as “a procedure that uses a laser or other device registered with the United States Food and Drug Administration (USFDA) for nonablative procedures performed on the skin or hair,” without a certificate in advanced esthetics.<sup>12</sup> In 2021, the Oregon Estheticians for Fair Licensing (OEFL) requested to pass a law allowing them to use Mechanical or electrical apparatus, appliance or device which do not “penetrate beyond the epidermis except through natural physiological microdermabrasion.” These include galvanic current, high-frequency microcurrents, light-emitting diode therapy, and microdermabrasion. However,

the rulemaking process has been paused at this time.<sup>13</sup>

## AESTHETICIAN SURVEY RESULTS

Estheticians were interviewed in five states including California, Florida, Michigan, Oregon, and Texas regarding their role in the plastic surgery practice and results are summarized in **Table 3**. Every aesthetician played a role in the perioperative care of the patient, whether it was preparing them for surgery or partaking in post-operative care or both. The common procedures aestheticians perform and the technologies they use vary by state. Based on our survey the most common procedures were peels in Oregon, Florida, and Michigan, facials in California and lasers in Texas. The most common preoperative procedures aestheticians are performing include skin care evaluation and optimization for surgery. Each aesthetician we spoke with plays an important role in the post-operative care of the patient. This includes facials, skin calming treatments, camouflage make-up or simply providing comfort and reassurance during the post-operative visits. In several states aestheticians are performing lymphatic massage and drainage after facelifts.

The most common skin care concerns aestheticians encounter are acne, hyperpigmentation, and aging skin. Recommending and selling skin care products were done by every aesthetician we interviewed and they stated it was an important part of the skin maintenance plan. Some of the biggest challenges aestheticians face are similar to those faced by facial plastic surgeons such as patients having unrealistic expectations and the desire for instantaneous results. The aestheticians

**Table 3**  
**Aesthetician survey responses: scope of practice and common procedures**

State	Procedures Performed	Most Common Procedure	Degree of Oversight	Pre-Operative	Post-Operative	Skin Care Products
CA	Lymphatic massage VASER® <sup>a</sup> Shape Diamond Glow® Facial Skin Better Science AlphaRet Peels Sofwave® Coolsculpting® Velashape®	Diamond Glow® Facial	Physicians signs all of treatment sheets & charts	Optimizing skin care routine weeks before surgery	Sees patients 2 weeks post-op, US lymphatic massage for face-lift patients	Alastin, Skin Better Science, Isidin
FL	Facials Peels Skin care consultations	Peels	Physician in facility, physician doesn't sign treatment sheets and charts	Skin care assessment and recommendations	Lymphatic drainage, suture removal, skin calming treatments, hydration treatments	Private label, Obagi, Latisse, Viviscal hair vitamins
MI	Facials Micropeels ErbYag laser Diode laser LHR IPL RF microneedling Ulthera® Thermage® Dermaplane	Peels	Physician doesn't see new patients prior to treatment, refers to physician when concerned, physician signs charts	Start skin maintenance prior to surgery, goal 3 treatment prior to Facelift. RetinA for all patients, bleaching cream if needed	Classical facial 4–6 wks after surgery, lymphatic treatment 4–6 wks after surgery, provides comfort, there to hold their hand and tell them their recovery is normal. Reassurance	SkinceuticalObagi, Private label
NY	Lymphatic drainage Peels Hydrafacial	Facials	Physician in facility	Optimize skin care	Lymphatic drainage	Alastin ZO Skin
OR	Facials Waxing Peels Microdermabrasion Microneedling Skin care consults Makeup post-procedure	Peels	Physicians sign all chart notes and treatment plan	Start on a skin care regimen and perform a microdermabrasion treatment	Hydrating facial and camouflage makeup. Sees post-op patients with physician 2–3 times	PCA Skin, ZO Skin

*(continued on next page)*

**Table 3**  
(continued)

State	Procedures Performed	Most Common Procedure	Degree of Oversight	Pre-Operative	Post-Operative	Skin Care Products
TX	Lasers: fractionated CO <sub>2</sub> , Cutera XLV® RF microneedling Peels Coolsculpting® TrueFlex® Visia® skin analysis	Laser resurfacing	Physician in facility Physician doesn't sign notes	N/A	Scar treatment	Skincareuticals, Alastin, EltaMD, Skinmedica

*Abbreviations:* IPL, intense pulsed light; LHR, laser hair removal; RF, radiofrequency.

<sup>a</sup> VASER® shape uses massage therapy and ultrasound technology to smooth and contour different body areas.

we surveyed listed these as well as managing acne and melasma as the most challenging aspects of their job.

## DISCUSSION

Aestheticians have become a vital part of many plastic surgery practices and play a unique and important role in the care team. Having non-surgical treatment options can attract patients who are not ready for surgery or complement surgical procedures. New technologies, including lasers, intense pulsed light (IPL), radiofrequency, ultrasound, and other technologies and injectables, are flooding the market and are being used to tighten and resurface skin, decrease pigment, and stimulate collagen production. Skin care is an important part of preparing patients for these procedures as well as in the post-procedure phase.

Skin care consultations are an important part of the aesthetician's job and are a way to bring patients into the practice. In several of the practices we surveyed, aestheticians are using the Visia Skin Analysis (Canfield) to perform skin care consultations with patients as well as track patient progress after undergoing treatment and starting new skin care products. This device uses cross-polarized and UV lighting to quantify sun damage, wrinkles, uneven skin texture, and inflammation. It is also a useful tool for taking before and after photos with controlled head position and lighting.

In a 2004 publication on incorporating skin care into facial plastic surgery practice, laser hair reduction was listed under the services provided by an aesthetician.<sup>14</sup> However, the legislation and regulations around lasers and laser hair removal vary state by state and in the majority of states this is out of the scope of practice of an esthetician.<sup>15</sup> We recommend reaching out to specific medical boards and cosmetology boards to determine specific state regulations.

In most states aestheticians cannot operate lasers, however, aestheticians can play an important role in pre- and post-laser resurfacing treatment of patients, they can see the patient in the immediate post-treatment stage and make sure the patient is using the correct products and sun protection for optimal recovery.

Skin care products are another important component of the non-surgical side of plastic surgery practices. The global skincare market size is growing rapidly and is expected to reach USD 145.82 billion by 2028.<sup>16</sup> A 2020 retrospective study found that more patients who bought skin-care products went on to purchase nonsurgical treatments than those who did not buy skin care

products.<sup>17</sup> Therefore, being able to offer comprehensive skin care along with products keeps patients happy and introduces them to nonsurgical technology. It justifies and helps sustain investments in non-surgical technologies such as radio-frequency microneedling, intense pulsed light, non-ablative lasers, and electromagnetic muscle toning devices for facial plastic surgery practices and an aesthetician can play an important role here.

## NUTRACEUTICALS AND SYSTEMIC SUPPLEMENTS TO PROMOTE HEALTHY SKIN

It is often said that true beauty comes from within. The term nutraceutical was first used in 1989 by Stephen DeFelice, founder and chairman of the Foundation for Innovation in Medicine (FIM), Cranford, New Jersey<sup>18</sup> and came from combining "pharmaceutical" and "nutrition." The Oxford English Dictionary defines nutraceutical as "a foodstuff, food additive, or dietary supplement that has beneficial physiological effects but is not essential to the diet. Also called functional food."<sup>19</sup> The US Nutraceutical Research and Education Act presented to the House of Representatives in the first session of the 106th Congress of 1999–2000 defined nutraceutical as "a dietary supplement, food or medical food ... that (1) has a benefit which prevents or reduces the risk of a disease or health condition, including the management of a disease or health condition or the improvement of health; and (2) is safe for human consumption in the quantity, and with the frequency required to realize such properties."<sup>20</sup>

Popularity and use of nutraceuticals and over the counter supplements continues to increase and they are found on the shelf next to skin care items in many facial plastic surgery practices. They can be used before and after surgery to enhance healing or they can be used in combination with non-surgical procedures or independently. Market research by Variant Market Research, Pune, India shows that the nutraceutical industry has been growing at a Compound Annual Growth Rate (CAGR) of 7.2% from 2016 to 2024 and will reach \$340 billion by 2024.<sup>21</sup>

Nutraceuticals can be categorized into groups based on the structural class of the main active ingredient. Collagen falls into the category of bioactive peptides. Collagen type I and III is produced by dermal fibroblasts and provide the amino acid building blocks for hair, skin, nails, and bone.<sup>22</sup> Collagen breakdown increases with aging and sun exposure and collagen and elastin decrease with age, therefore, collagen supplementation is a topic of interest in the skin care

and cosmetic industry. It has been shown that due to its large molecular weight (130–300 kDa), collagen does not penetrate the epidermis and topical application doesn't provide skin benefits, therefore, oral supplementation with collagen peptides is being studied.<sup>23</sup> Hydrolyzed collagen is made from gelatin and consists of small peptides with low molecular weight and is preferred for oral supplementation because it is rapidly absorbed in the digestive tract. Ingested hydrolyzed collagen is metabolized into small di- or tripeptides and found in the bloodstream two hours after ingestion. One of the dipeptides, proline-hydroxyproline, has been shown to increase cell proliferation (1.5-fold) and hyaluronic acid synthesis (3.8-fold) at a dose of 200 nmol/mL in cultured human dermal fibroblasts.<sup>24</sup>

A study was done in rats looked at 14 C-labeled proline and hydroxyproline in low molecular weight collagen hydrolysate to determine the distribution of ingested collagen in various organs and tissues. They found that the radioactivity in skin at 14 days after ingestion was still elevated at 70% of that six hours after ingestion. By hydrolyzing the skin of the rats, 14 days after ingestion, and analyzing it with

thin-layer chromatography, they found that the proline and hydroxyproline were incorporated into the skin. This signifies that orally supplemented collagen hydrolysate can be used for the synthesis of proteins in skin in rats.<sup>25</sup>

The source of collagen is an important factor to consider in oral collagen supplements. Collagen has been derived from bovine, porcine, vegetable, human, marine, and synthetic sources for use in the cosmetic and skin care industry. Marine collagen has been shown to be more easily absorbed than animal collagen, have a lower molecular weight and less biological contaminants.<sup>26</sup>

There have been multiple human clinical trials investigating the benefits of collagen supplementations for skin and anti-aging. A randomized, controlled single-center study with 52 female participants compared daily ingestion of collagen to maltodextrin on skin moisture, elasticity and wrinkle depth. Skin moisture was measured with a corneometer, skin elasticity was measured with a cutometer, and wrinkle depth was analyzed with 3D imaging. They saw an increase in skin moisture index ( $50.0 \pm 8.7$  at T0 and increased to  $55.1 \pm 7.8$  and  $56.8 \pm 8.2$  following 28 and

**Table 4**  
**Common nutraceuticals and their ingredients**

	<b>Nutrafol®</b>	<b>Visiscal®</b>	<b>Skinade®</b>
Vitamins	A, C, D, E, biotin	C, niacin, biotin	C, B-Complex (riboflavin, niacin, biotin, folate, B12)
Minerals	Iodine, zinc, selenium	Calcium, iron, zinc	MSM
Bioactive peptides	Hydrolyzed marine collagen type I & III <sup>a</sup>	AminoMar Marine Complex 536 mg	Hydrolyzed marine collagen 7000 mg
Amino Acids	L-lysine L-methionine L-cysteine		L-lysine
Carotenoid	Astaxanthin		
Bioactive botanical extracts	Organic gelatinized maca root Saw palmetto fruit CO2 extract Ashwagandha extract Liposomal curcumin extract Full-spectrum palm extract Horsetail extract Japanese knotweed root extract (50% resveratrol) Black pepper fruit extract (95% piperine) Capsicum extract	Horsetail extract Millet seed extract	Flaxseed
Polyunsaturated fatty acids			Omega 3 & 6

Abbreviation: MSM, methylsulfonylmethane.

<sup>a</sup> Exact dose unclear as it is listed as an ingredient of the 1875 mg Synergen Complex® Plus.



56 days of treatment ( $p < 0.01$ ), mean skin elasticity index ( $0.604 \pm 0.1$  at T0 and increased to  $0.630 \pm 0.1$  and  $0.651 \pm 0.1$  following 28 and 56 days of treatment ( $p < 0.01$ ), and wrinkle depth (T0 was  $0.096 \pm 0.01$ ; at T28 and T56, the mean wrinkle depth was  $0.092 \pm 0.02$  and  $0.089 \pm 0.02$ , respectively ( $p < 0.01$ )).<sup>27</sup>

A double-blind, randomized, placebo-controlled clinical trial was done with  $n = 120$  where 60 subjects were in the control group and took a placebo and 60 subjects received an oral supplement containing collagen type I (5,000 mg), with a molecular weight of 0.3–8 kDa, hyaluronic acid, borage oil and N-acetylglucosamine, vitamins and a blend of antioxidants. The researchers looked at skin elasticity (expressed as Young's elasticity modulus) and skin architecture (histological analysis of biopsies taken in 2 patients) as well as patient satisfaction through questionnaires at day 0 and day 90. They saw a 7.5% increase in skin elasticity in the group receiving the supplement compared to -5% decrease in the control group.<sup>28</sup>

Other types of nutraceuticals include bioactive polysaccharides (glycosaminoglycans), bioactive botanical extracts, carotenoids, vitamins, Coenzyme Q10 (CoQ10), and polyunsaturated fatty acids. Botanical extracts contain polyphenols, which can be further broken down into lignans, flavonoids, flavanols, flavones, flavanones, isoflavones, anthocyanidines, and stilbenes.<sup>29</sup>

Novel formulations are combining the various forms of nutraceuticals to create systemic supplements to promote healthy skin and/or hair (**Table 4**). Skinade® is a skin supplement which includes marine collagen, MSM, vitamin C, L-lysine, flaxseed and vitamin B complex.<sup>30</sup> Nutrafol® and Viviscal® are both hair supplements that have grown in popularity and can be found on the shelves at some facial plastic surgery practices next to skin care products. Nutrafol® contains vitamins A, C, D, and E, biotin, iodine, zinc, selenium and 1875 mg "Synergen Complex® plus" which contains organic gelatinized maca root, saw palmetto fruit CO2 extract (>45% fatty acids), hydrolyzed marine collagen type I & III, Sensoril® ashwagandha root and leaf extract (10% withanolides), liposomal curcumin (rhizome) extract (>45% curcuminoids), full spectrum palm extract (20% tocotrienol/tocopherol complex), astaxanthin and 480 mg "Nutrafol® Blend" which contains L-lysine, L-methionine, L-cysteine, horsetail extract, Japanese knotweed root extract (50% resveratrol), black pepper fruit extract (95% piperine), capsicum extract (2% capsaicinoids). Viviscal® contains vitamin C, niacin, biotin, calcium, iron, zinc, AminoMar Marine Complex, horsetail extract, and millet seed extract.

## SUMMARY

Overall, multiple small studies suggest that nutraceuticals can provide clinically significant benefits for skin and hair, but further research is needed to establish a cause-effect relationship between the ingredients and the beneficial effects for the skin. Current human clinical trials using nutraceuticals often have a low number of subjects. The studies also vary widely in doses of active ingredients and bioavailability is frequently not mentioned. Importantly, caution must be taken when recommending supplements as large doses of some ingredients can be toxic. The facial plastic surgeon must be aware of the importance of choosing nutrients that are well-researched at a dose proven to be effective when recommending nutraceuticals to aesthetic patients.

## CLINICS CARE POINTS

- Small studies have shown that nutraceuticals can provide clinically significant benefits for skin and hair, but further research is needed to establish a cause-effect relationship between the ingredients and the beneficial effects.
- Having non-surgical treatment options such as lasers, intense pulsed light (IPL), radiofrequency, ultrasound and other technologies and injectables can attract patients who are not ready for surgery or can complement surgical procedures.

## REFERENCES

1. Associated Skin Care Professionals. Associated Skin Care Professionals. <http://www.ascpskincare.com>. Accessed March 30, 2023.
2. National Certification for Estheticians. NCEA History. <https://nceacertified.org/ncea-national-esthetician-association-history/>. Accessed March 31, 2023.
3. American Med Spa Association. How Microneedling Is Regulated. <https://americanmedspa.org/blog/how-microneedling-is-regulated>. Accessed January 29, 2023.
4. Department of Health and Human Services. Classification of the Microneedling Device for Aesthetic Use. Federal Registrar. 2018. Available at: <https://www.federalregister.gov/documents/2018/06/08/2018-12335/medical-devices-general-and-plastic-surgery-devices-classification-of-the-microneedling-device-for>.

5. American Med Spa Association. American Med Spa Association. SB 803 Barbering and cosmetology., 2021. (testimony of California Legislature).
6. Medical Board of California. Medical Assistants. Medical Board of California. Published 2022. <https://www.mbc.ca.gov/Licensing/Physicians-and-Surgeons/Practice-Information/Medical-Assistants.aspx>. Accessed January 29, 2023.
7. Pham T., Kemper A., Kemper P., FLORIDA BOARD OF COSMETOLOGY. Published online 2021. Available at: [http://www.myfloridalicense.com/dbpr/pro/cosmo/documents/cosmo\\_minutes\\_1021.pdf](http://www.myfloridalicense.com/dbpr/pro/cosmo/documents/cosmo_minutes_1021.pdf).
8. Pham T., Kemper A., Kemper P., Minutes florida board of cosmetology embassy suites 202 north tamiami trail sarasota, FL 34236. Published online 2021. Available at: [http://www.myfloridalicense.com/dbpr/pro/cosmo/documents/cosmo\\_minutes\\_1021.pdf](http://www.myfloridalicense.com/dbpr/pro/cosmo/documents/cosmo_minutes_1021.pdf).
9. DiGiorgio CM, Avram MM. Laws and regulations of laser operation in the United States. *Lasers Surg Med* 2018;50(4):272–9.
10. STATE OF NEW YORK IN ASSEMBLY.; 2021.
11. NY State Assembly Bill A2548. <https://www.nysenate.gov/legislation/bills/2023/A2548>. Accessed March 31, 2023.
12. Oregon Secretary of State Administrative Rules. <https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=264932>. Accessed March 31, 2023.
13. Oregon Health Authority. Oregon Health Authority: HLO News Details: Health Licensing Office: State of Oregon. <https://www.oregon.gov/oha/PH/HLO/Pages/News-Details.aspx?View=%7B84858868-A97E-409A-8B8B-ABB77E97CF25%7D&SelectedID=125>. Accessed March 31, 2023.
14. TerKonda RP. Incorporating skin care into a facial plastic surgery practice. *Minimally Invasive Office-Based Procedures* 2004;20(1):3–9.
15. Alam M. Who is qualified to perform laser surgery and in what setting? *Semin Plast Surg* 2007;21(3):193–200.
16. Skincare Market Share, Growth Industry Trends Analysis. Fortune Business Insights. Published August 2021. <https://www.fortunebusinessinsights.com/skin-care-market-102544>. Accessed January 22, 2023.
17. Austin R.E., Ahmad J. and Lista F., The impact of skin care product sales in an aesthetic plastic surgery practice. *Aesthet Surg J*, 40(3), 2020, 330-334.
18. Brower V. Nutraceuticals: Poised for a healthy slice of the healthcare market? *Nat Biotechnol* 1998;16(8):728–31.
19. Nutraceutical: Oxford English Dictionary. Published December 2022. <https://www.oed.com/>. Accessed April 1, 2023.
20. Aronson JK. Defining 'nutraceuticals': neither nutritious nor pharmaceutical. *Br J Clin Pharmacol* 2017;83(1):8–19.
21. Variant Market Research. Nutraceuticals Market Global Scenario, Market Size,Trend and Forecast, 2015-2024. <https://www.variantmarketresearch.com/report-categories/food-beverages/nutraceuticals-market/>. Accessed March 31, 2023.
22. Cole MA, Quan T, Voorhees JJ, et al. Extracellular matrix regulation of fibroblast function: redefining our perspective on skin aging. *J Cell Commun Signal* 2018;12(1):35–43.
23. Bos JD, Meinardi MMHM. The 500 Dalton rule for the skin penetration of chemical compounds and drugs. *Exp Dermatol* 2000;9:165–9. Available at: <http://chemfinder>.
24. Ohara H, Ichikaya S, Matsumoto H, et al. Collagen-derived dipeptide, proline-hydroxyproline, stimulates cell proliferation and hyaluronic acid synthesis in cultured human dermal fibroblasts. *J Dermatol* 2010;37(4):330–8.
25. Watanabe-Kamiyama M, Shimizu M, Kamiyama S, et al. Absorption and effectiveness of orally administered low molecular weight collagen hydrolysate in rats. *J Agric Food Chem* 2010;58(2):835–41.
26. Avila Rodríguez MI, Rodríguez Barroso LG, Sánchez ML. Collagen: a review on its sources and potential cosmetic applications. *J Cosmet Dermatol* 2018;17(1):20–6.
27. Bianchi FM, Angelinetta C, Rizzi G, et al. Evaluation of the efficacy of a hydrolyzed collagen supplement for improving skin moisturization, smoothness, and wrinkles. *J Clin Aesthet Dermatol* 2022;15(3):48–52.
28. Genovese L, Corbo A, Sibilla S. An insight into the changes in skin texture and properties following dietary intervention with a nutricosmeceutical containing a blend of collagen bioactive peptides and antioxidants. *Skin Pharmacol Physiol* 2017;30(3):146–58.
29. Pérez-Sánchez A, Barrajón-Catalán E, Herranz-López M, et al. Nutraceuticals for skin care: a comprehensive review of human clinical studies. *Nutrients* 2018;10(4):403.
30. Anderson KL. Clinical Evidence of the Anti-Aging Effects of a Collagen Peptide Nutraceutical Drink on the Skin. Published online 2020.