Growth in interest in facial rejuvenation has led to an increasing number of facial resurfacing procedures performed in recent years, as well as to a broadening of the demographics of the patients undergoing such procedures. This trend has been accompanied by a rise in the number of reports in the literature describing the various techniques available for these procedures. New technologies are gaining popularity, adding to the vast array of techniques available to the patient and the clinician. Despite recent publications, only limited comprehensive data are available on current trends.

As the popularity of facial resurfacing grows and the techniques continue to evolve, data on current practices are increasingly relevant for clinicians. The primary purpose of this study was to survey the current trends in facial resurfacing techniques among facial plastic surgeons. Second, it assessed the impact of patient Fitzpatrick skin type and practice characteristics on the selection of resurfacing techniques.

**Methods.** A cross-sectional study, approved by the institutional review board of Pennsylvania State University College of Medicine, was performed using a self-administered questionnaire consisting of 17 questions. A Web link to the questionnaire was emailed to the members of the American Academy of Facial Plastic and Reconstructive Surgery (AAFPRS). Each survey was confirmed as a distinct response by using a unique Internet Protocol address. The responses were then archived in a database and analyzed for trends.

Inclusion criteria consisted of current AAFPRS members with active e-mail addresses and successful completion of a Facial Plastic and Reconstructive Surgery fellowship. Exclusion criteria included incomplete surveys. Statistical analysis was performed using the $\chi^2$ and Fisher exact tests.

**Results.** Of 673 surveys e-mailed, 172 surveys were returned (a response rate of 26%). Most respondents (68%) were in private practices, whereas the remaining 32% were divided between academic practice only and a combination of both. Almost all of the respondents practiced in a suburban or urban setting (52% and 44%, respectively), while only 4% served rural areas. Fifty-two percent of the respondents had practices comprised of facial plastic surgery only.

Most respondents prescribed antivirals (88%), retinoids (54%), and hydroquinones (50%) as part of their perioperative treatment. These therapies were prescribed either alone or in combination. Of note, 4% of the respondents stated that they do not prescribe any medications. Sixty percent treated patients preoperatively for less than 3 weeks, whereas the remainder prescribed medications for longer periods: 31% prescribed for 3 to 6 weeks, and 5% prescribed for more than 6 weeks.

Overall, only 20% of the respondents used laser for resurfacing in patients with advanced Fitzpatrick skin types. Thirty-nine percent of the respondents reported rarely using laser on advanced Fitzpatrick skin types. The remaining 41% did not have many patients with advanced skin types.

The majority (53%) of the respondents considered not performing laser treatments on patients with Fitzpatrick skin type IV or higher (Figure 1). In contrast, 4% of the respondents performed laser treatments on patients with any skin type. Sixty-one percent of respondents who do not commonly treat patients with advanced Fitzpatrick skin types considered not performing laser treatments on those with a Fitzpatrick skin type of IV or higher, whereas only 25% of respondents who commonly treat patients with advanced Fitzpatrick skin types considered not performing laser treatments on those with Fitzpatrick skin types IV or higher. Furthermore, among these latter respondents, 18% had no hesitation treating any skin type ($P<.001$).

Respondents who treat patients with advanced Fitzpatrick skin types demonstrated a different pattern in the use of chemical peel agents compared with those who do not ($P<.05$). On the one hand, most (75%) of the respondents who treat advanced Fitzpatrick skin types used trichloroacetic acid (TCA) 35% and Jessner solution most frequently, followed by TCA, 10% to 20% (21%). On the other hand, respondents who do not treat advanced Fitzpatrick skin types used TCA 33%/Jessner 35% more frequently.

**Figure 1.** Respondents not performing laser treatment on various Fitzpatrick skin types.
The most frequently used technology was carbon dioxide laser (41%), followed by intense pulsed light (IPL) (27%), erbium:YAG laser (15%), and fractionated photothermolysis, a 1550-nm erbium fiber laser (14%) (Figure 2). Respondents who treat advanced Fitzpatrick skin types used 4 types of technologies frequently: intense pulsed light (27%), carbon dioxide laser (23%), erbium:YAG laser (23%), and fractionated photothermolysis (19%). In contrast, respondents who do not treat patients with advanced Fitzpatrick skin types predominantly used 1 technology, carbon dioxide laser (P < .05).

Among a variety of chemical peel agents available, respondents reported TCA, 35%/Jessner (55%), and TCA 10% to 20% (22%), as the 2 most frequently used agents. The types of chemical peel agents used by those respondents with emphasis in facial plastic surgery were different from those respondents with practices of a broader scope (P < .05). Sixty-seven percent of respondents who focused exclusively on facial plastic surgery reported using TCA 35%/Jessner most frequently. In contrast, the agents used by respondents whose practices were not limited to facial plastic surgery were split almost evenly between TCA 35%/Jessner, and TCA 10% to 20%.

In addition, the number of years in practice correlated with the number of chemical peel agents being used frequently by respondents (Figure 3). Those with more than 11 years of practice experience reported using 3 agents frequently, whereas respondents with less than 5 years of experience reported the predominant use of only 1 chemical peel agent (P < .01).

Aquaphor (Beiersdorf Inc, Wilton, Connecticut) was the most frequently used (60%) postoperative dressing followed by petroleum ointment (34%), other occlusive dressings (20%), and Xeroform (0.7%) (Kendall, Mansfield, Massachusetts). Three percent of the respondents reported not prescribing any postoperative care. Twenty-two percent of the respondents used others, including Eucerin (Beiersdorf Inc), copper-based cream, and Crisco (J. M. Smucker Co, Orrville, Ohio).

The most common postoperative concerns included prolonged erythema (73%), hyperpigmentation (46%), and hypopigmentation (22%). Dermatitis (6%) and scarring (4%) were also reported, whereas postoperative infection was not.

Comment. Technology in resurfacing has been one of the most evolving areas of facial rejuvenation. Since the development of the carbon dioxide laser, newer technologies, such as erbium:YAG and photothermolysis, with shorter “downtime” have been developed. Even so, the current study indicates the carbon dioxide laser to be the most commonly used technology and the TCA 35%/Jessner combination to be the most frequently used peeling agent.

Additional examination of the survey responses revealed characteristics that resulted in statistically different technique selection patterns. More specifically, years of practice (P < .01) and emphasis on facial plastic surgery (P < .05) had an impact on preferences in chemical peels. The respondents with nonexclusive facial plastic practices and respondents who have more than 11 years of practice experience used 2 or 3 agents frequently, whereas their counterparts used 1 agent predominantly. Furthermore, respondents who treat patients with advanced Fitzpatrick skin types had statistically different patterns of laser (P < .05) and chemical peel usage (P < .05) as discussed herein.

Caution in treating patients with advanced Fitzpatrick skin types, as shown herein and in the literature, is likely related to postoperative concerns. Patients with Fitzpatrick skin types III and IV can develop erythema and postinflammatory hyperpigmentation lasting up to 6 months.7,8 Interestingly, it is inevitable that more patients with advanced skin types will seek care because more than 50% of the US population will be of non-European decent by the year 2056. Therefore, additional research in resurfacing the advanced skin types will be necessary to continue facial rejuvenation in the general population in the future.

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