Cosmetic Dermatologic Surgical Training in US Dermatology Residency Programs
Identifying and Overcoming Barriers

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**IMPORTANCE** The public and other medical specialties expect dermatologists who offer cosmetic dermatology services to provide competent care. There are numerous barriers to achieving cosmetic dermatology competency during residency. Many dermatology residents enter the workforce planning to provide cosmetic services. If a training gap exists, this may adversely affect patient safety.

**OBJECTIVES** To identify resources available for hands-on cosmetic dermatology training in US dermatology residency training programs and to assess program director (PD) attitudes toward cosmetic dermatology training during residency and strategies, including discounted pricing, used by training programs to overcome barriers related to resident-performed cosmetic dermatology procedures.

**DESIGN, SETTING, AND PARTICIPANTS** An online survey in academic dermatology practices among PDs of US dermatology residency programs.

**MAIN OUTCOMES AND MEASURES** Frequency of cosmetic dermatology devices and injectables used for dermatology resident hands-on cosmetic dermatology training, categorizing PD attitudes toward cosmetic dermatology training during residency and describing residency-related discounted pricing models.

**RESULTS** Responses from PDs were received from 53 of 114 (46%) US dermatology residency programs. All but 3 programs (94%) offered hands-on cosmetic dermatology training using botulinum toxin, and 47 of 53 (89%) provided training with hyaluronic acid fillers. Pulsed dye lasers represented the most common laser use experienced by residents (41 of 52 [79%]), followed by Q-switched Nd:YAG (30 of 52 [58%]). Discounted procedures were offered by 32 of 53 (60%) programs, with botulinum toxin (30 of 32 [94%]) and fillers (27 of 32 [84%]) most prevalent and with vascular lasers (17 of 32 [53%]) and hair removal lasers (12 of 32 [38%]) less common. Various discounting methods were used. Only 20 of 53 (38%) PDs believed that cosmetic dermatology should be a necessary aspect of residency training; 14 of 52 (27%) PDs thought that residents should not be required to perform any cosmetic dermatology procedures.

**CONCLUSIONS AND RELEVANCE** Although almost every program provides hands-on cosmetic dermatology training, there are barriers to training, including patient preferences, costs of procedures and products, and PD attitudes toward cosmetic dermatology training. To promote patient safety, procedural competency is imperative.

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As the demand for cosmetic dermatology procedures has increased, so has the number of physicians and non-physicians providing these services. Many noninvasive cosmetic procedures are performed by aestheticians or other practitioners in spa settings with minimal or no oversight. The number of adverse events associated with these establishments is unknown. In 2011, USA Today published a series of articles describing the pitfalls of cosmetic surgery provided by nonphysicians and untrained health care providers. In a joint reply, the American Academy of Dermatology Association and the American Society for Dermatologic Surgery responded that “dermatologists have the medical education, training, and experience to perform cosmetic surgery.” In support of this statement, the Accreditation Council for Graduate Medical Education (ACGME) through its Residency Review Committee (RRC) for Dermatology requires “significant exposure” by performing, assisting, or observing procedures involving lasers, chemical peels, botulinum toxin, intense pulsed light, and soft-tissue augmentation. However, evidence from previous surveys has revealed variable training experience.

Many potential barriers exist to incorporating cosmetic dermatology training in residency curricula, including high supply costs for resident training workshops, physician resistance to addressing purely aesthetic concerns in the academic setting, a lack of cosmetic dermatology training among many academic core faculty, and the unavailability of patients willing to undergo procedures by inexperienced residents. The objectives of this study were to identify resources available for hands-on cosmetic dermatology training in US dermatology residency training programs and to assess program director (PD) attitudes toward cosmetic dermatology training during residency and strategies, including discounted pricing, used by training programs to overcome barriers related to resident-performed cosmetic dermatology procedures.

Methods

The Ethics Review Board of the University of South Dakota approved the study. Informed consent was waived. A cross-sectional, anonymous, voluntary survey was e-mailed to PDs of the 114 dermatology residency programs in the United States. A cover letter was provided to participants explaining the details and intent of the survey. An e-mail link was distributed, and the survey was administered via a free online service.

The survey contained demographic questions and cosmetic dermatology training-related inquiries in multiple-choice and free-text response formats. The PDs were asked to describe their program’s current training environment, including the types of hands-on procedural opportunities integrated in their resident curriculum and any residency-related discounted pricing. The PDs were also asked to state their views on the role of cosmetic dermatology training during residency and to estimate the cosmetic dermatology practice of former and upcoming graduates. (The survey can be found in the eAppendix in the Supplement.)

Results

Demographics

A total of 53 PDs (46%) responded to the survey. Their demographics included the Midwest (16 [30%]), Northeast (14 [26%]), Southeast (8 [15%]), West (8 [15%]), and Southwest (6 [11%]); this question was skipped by 1 PD. At least 1 faculty dermatologist performs cosmetic dermatology procedures in 91% (48 of 53) of responding programs, with 32% (17 of 53) of these faculty members having completed a formal cosmetic dermatology fellowship.

Resident Hands-on Experience With Cosmetic Dermatology Procedures

Table 1 summarizes the resident experience with cosmetic dermatology procedures. Botulinum toxin was the most common cosmetic dermatology procedure performed in residency, with all but 3 programs (94%) providing hands-on cosmetic dermatology training using it. Almost as many programs provided resident experience in soft-tissue augmentation with the use of hyaluronic acid fillers by 89% (47 of 53), calcium hydroxyapatite fillers by 47% (25 of 53), and poly-L-lactic acid fillers by 43% (23 of 53). Experience with laser use also commonly occurred during dermatology residency. Pulsed dye lasers (585 nm/595 nm) were the most common lasers used.
by residents (79% [41 of 52] of 8 programs), followed by Q-switched Nd:YAG (58% [30 of 52]), fractionated carbon dioxide resurfacing (38% [20 of 52]), alexandrite (31% [16 of 52]), and potassium titanyl phosphate (29% [15 of 52]). Intense pulsed light procedures were performed by residents in 52% (27 of 52) of responding programs.

Enrolling Patients for Resident Procedures
Discounted pricing for selected cosmetic dermatology procedures was offered by 60% (32 of 53) of programs (Table 2). Of dermatology programs offering resident discounts, botulinum toxin (94% [30 of 32]) and fillers (84% [27 of 32]) were the most commonly discounted procedures. Vascular laser and hair removal laser procedures were less commonly discounted (53% [17 of 32] and 38% [12 of 32], respectively). One program offered every cosmetic dermatology procedure performed by a resident free of charge, and 1 program waived all fees except product fees. Three programs offered a 75% discount, 8 programs a 50% discount, and 7 programs a 25% discount, while 4 programs had variable discount methods. Nine programs used other forms of discounting, including sponsorship of no-charge workshops using patient volunteers and products donated by pharmaceutical companies. One program eventually discontinued this practice because of conflicts with university policy about relationships between pharmaceutical companies and residents.

PD Perceptions of Cosmetic Training
Most responding PDs reported that residents express a desire for more cosmetic dermatology training and that most graduates perform cosmetic dermatology procedures after graduating. However, PDs displayed a wide variety of attitudes toward cosmetic dermatology in the academic setting. Only 38% (20 of 53) believed that cosmetic dermatology should be a necessary aspect of residency training. Three PDs thought that cosmetics should have no role in resident training, with one PD commenting: “I realize this may be extreme, but I don’t believe cosmetic procedures should be part of dermatology or derma-
tology training at all.” Only 17% (9 of 52) believed that it was appropriate for residents to experience hands-on cosmetic dermatology procedures (including lasers, fillers, and botulinum toxin) with supervision as early as the first year of training. Ten percent (5 of 52) thought that hands-on cosmetic dermatology training should be reserved until the second year or later, and 31% (16 of 52) thought that hands-on cosmetic dermatology experience should not occur until the final year of training. One PD stated: “Residents should be given flexible training and gradations of opportunity based on the skills they have exhibited, the interest they have, and the time they put into it.” Twenty-seven percent (14 of 52) thought that residents should not be required to perform any cosmetic dermatology procedures and that observation alone should be the expectation.

Discussion
Dermatologists have contributed significantly to the evolution of cosmetic surgery, including advancements in laser surgery, rhytidectomy, dermabrasion, blepharoplasty, botulinum toxin, chemical peeling, hair transplantation, tumescent liposuction, reconstructive surgery, and soft-tissue augmentation. A 2012 survey of 561 primary care physicians identified dermatologists as the most qualified specialists to inject botulinum toxin and fillers and to perform laser procedures. To continue as innovators and leaders in the safe performance of cosmetic dermatology procedures, future dermatologists must be properly trained.

Regardless of prevailing PD attitudes toward the value and necessity of cosmetic dermatology training, the results of this survey demonstrate that almost every program provides hands-on cosmetic dermatology training during dermatology residency. This training occurs in many different ways, and the varying attitudes reported by PDs may contribute to that incongruity. There is clearly a lack of agreement as to what role residents should have in cosmetic dermatology training and when the change from observer to performer should occur, if ever.

Most PDs state that residents desire more training in cosmetic dermatology. This is consistent with surveys in which US residents reported dissatisfaction with cosmetic dermatology training. Between 52% and 82% of residents indicate that they plan to incorporate cosmetic dermatology into at least a small portion of their future practice. In our study, PDs predicted that an increasing percentage of program graduates will perform cosmetic dermatology procedures in the 5 years after graduating (Table 3). In light of these predictions, ensuring that patients receive safe, competent, and appropriate care should be of paramount importance to resident education.

From 2004 through 2011, the most common citations for dermatology residency programs issued by the RRC for Der-

Table 2. Programs With Discounted Pricing for Resident Cosmetic Procedures

<table>
<thead>
<tr>
<th>Variable</th>
<th>Programs, No. (%)</th>
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<tbody>
<tr>
<td>Cosmetic procedure</td>
<td>(n = 53)</td>
</tr>
<tr>
<td>Botulinum toxin</td>
<td>30 (94)</td>
</tr>
<tr>
<td>Skin filler</td>
<td>27 (84)</td>
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<tr>
<td>Vascular lesion laser</td>
<td>17 (53)</td>
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<tr>
<td>Hair removal laser</td>
<td>12 (38)</td>
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<tr>
<td>Superficial chemical peel</td>
<td>11 (34)</td>
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<tr>
<td>Nonablative laser</td>
<td>6 (19)</td>
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<tr>
<td>Liposuction</td>
<td>3 (9)</td>
</tr>
<tr>
<td>Ablative laser</td>
<td>1 (3)</td>
</tr>
<tr>
<td>Other</td>
<td>3 (9)</td>
</tr>
<tr>
<td>“I don’t know”</td>
<td>1 (3)</td>
</tr>
<tr>
<td>Typical discount, %</td>
<td>(n = 53)</td>
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<tr>
<td>100</td>
<td>1 (2)</td>
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<tr>
<td>Approximately 75</td>
<td>3 (6)</td>
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<td>Approximately 50</td>
<td>8 (15)</td>
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<td>Approximately 25</td>
<td>7 (13)</td>
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<tr>
<td>Variable</td>
<td>4 (8)</td>
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<tr>
<td>Other</td>
<td>9 (17)</td>
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<tr>
<td>None</td>
<td>21 (40)</td>
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matology were related to procedural experience, including insufficient variety and number of procedures. In response to potential inadequacies, the RRC in 2012 changed the procedural categorization within the mandatory ACGME Case Log System used to evaluate dermatology residency programs. Under the new system, all procedures are assigned to 1 of 3 categories of competency. Level 1 requires residents to be able to competently perform a procedure as a result of direct hands-on education. Level 2 mandates “significant exposure...through [at least] direct observation or as Assistant.” For Level 3, faculty members are expected to (at least) provide didactics, but residents neither have to perform nor observe these procedures. Vascular laser treatment is the only Level 1 cosmetic procedure. Level 2 cosmetic procedures include intense pulsed light, soft-tissue augmentation, hair and pigment removal, superficial chemical peels, botulinum chemodenervation, and ablative and nonablative lasers. Level 3 consists of vein surgery, scar revision, dermabrasion, hair transplantation, tumescent liposuction, and rhinophyma correction. Since July 2012, a residency program is considered out of compliance and at risk of an ACGME citation if in any 2 of 3 years the average for more than any 2 Level 1 index procedures or any 6 Level 2 index procedures falls below 2 SDs of the national mean. It is controversial whether national averages are the most useful criteria for deciding what constitutes significant exposure or what leads to competence. Moreover, it could be debated whether dermatologists have the medical education, training, and experience to perform cosmetic dermatologic surgery if observation alone is required for successful completion of residency.

Although the ACGME requires hands-on experience with only Level 1 cosmetic dermatology procedures, our study noted that residents are gaining such experience in various cosmetic dermatology procedures, especially pulsed dye lasers and botulinum toxin and hyaluronic acid fillers. The amount of hands-on experience was not quantified in our study, but dermatology residents have previously estimated cosmetic dermatology experience. In a 2011 study, most residents performed fewer than 10 filler procedures and 10 botulinum toxin procedures during the 3-year residency but believed that they were adequately prepared. This is consistent with national data from the ACGME dermatology case log for residents completing programs in the 2011-2012 trainee year. By the completion of training, residents on average reported 13.7 and 7.7 hands-on experiences with injecting botulinum toxin and skin fillers, respectively, with 50% of residents logging fewer than 8 and 5 procedures, respectively (Table 4). For the vascular lesion laser, in which residents are expected to achieve competence, 12.1 hands-on experiences were documented on average, with 50% of residents recording fewer than 7 procedures. Other notable national averages of resident surgeons are summarized in Table 4. Given the lack of industry-wide standards, growing multitude of products and techniques, and differing complexities within varying facial aesthetic subunits, it is unclear whether residents are acquiring sufficient experience with procedures to achieve the necessary competency to incorporate the full spectrum of cosmetic dermatology in their future practice.

Patients pursuing expensive cosmetic procedures often are wary of allowing inexperienced residents to perform procedures, even under the direct supervision of qualified dermatologists. To overcome this barrier, most programs offer some form of patient discount for cosmetic dermatology procedures performed by residents. Diverse discount methods are used, including fixed-percentage discounts and residency workshops with patient volunteers. It would be relevant to compare the cosmetic dermatology experience of residents in programs with vs without discounts, but this was beyond the scope of this article.

There are limitations to this study. With a response rate of 46% (53 of 114), a risk of selection bias is present. The PDs who participated may have strong opinions not reflective of PDs who did not participate in the survey. Programs that offer no cosmetic dermatology experience for residents may be underrepresented because they may use PDs with strongly negative views toward cosmetic dermatology. Alternatively, PDs having ambivalent attitudes toward cosmetic training or aligned with current RRC guidelines may have not been compelled to take the survey. Respondents were able to skip questions, allowing for selective responses. Some of the data were accrued from PD estimations of graduate behavior in practice. Data were not necessarily derived from actual ACGME case log documentation or postgraduate surveys. Cosmetic dermatology procedural competency can be achieved through experience occurring after residency as well, including hands-on courses offered at several local, regional, and national meetings. Therefore, residency cosmetic dermatology training is not
necessarily the surrogate marker of competence for cosmetic procedures occurring after residency.

Competency and patient safety should be the driving force in the integration of cosmetic dermatology training into residency programs. It is difficult to criticize the competence of other professionals if we are not first ensuring the hands-on procedural competence of the 80% who finish our training programs and plan to perform such procedures. To better promote patient safety, the RRC should consider requiring a greater level of hands-on experience with cosmetic dermatology procedures. Future studies might assess through postresidency surveys whether significant exposure prepared recent graduates who integrate cosmetic dermatology into their practice. Most PDs in dermatology have roots in medical dermatology and not cosmetic dermatology. This may influence the vigor with which programs approach overcoming barriers to improve cosmetic dermatology training beyond what is required. With patient safety in mind, some PDs may need to set aside personal biases against cosmetic dermatology training of residents and to adjust curriculum effort to achieve greater experience.

The incorporation of the ever-evolving field of cosmetic dermatology into academic residency programs has to be carefully balanced with respect to medical dermatology, pediatric dermatology, dermatopathology, and other aspects of procedural dermatology. However, patient safety must remain at the center of any considerations. To assure the public, as well as our fellow physicians, that dermatologists have received the medical education, training, and experience to competently perform cosmetic dermatology procedures, we need continuous reevaluation of program requirements by the RRC for Dermatology and attempts by PDs to overcome barriers to resident competence in areas relevant to future practice. This is the responsibility of academic dermatology programs nationwide.

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Study concept and design: All authors.
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Analysis and interpretation of data: All authors.
Drafting of the manuscript: All authors.
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REFERENCES