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CONSENSUS ARTICLE

Needs and Gaps in Resident Trainee Education, Clinical Patient Care, and Clinical Research in Cosmetic Dermatology: Position Statement of the Association of Academic Cosmetic Dermatology

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Abstract
Cosmetic dermatology is a key subspecialty of academic dermatology. As such, academic centers are expected to demonstrate excellence in the teaching of cosmetic dermatology skills to trainees, the clinical delivery of cosmetic dermatology services to patients, and the performance of clinical research that advances knowledge and uncovers new therapies in cosmetic dermatology. The Association of Academic Cosmetic Dermatology (AACD), a newly formed medical professional society, includes as its principal aims the support of all of these areas. AACD is comprised of group of board-certified dermatologists who teach cosmetic and laser dermatology at US dermatology residency programs. An expert panel constituted by the AACD recently convened a workshop to review gaps pertaining to academic cosmetic dermatology. This panel considered needs and potential corrective initiatives in three domains: resident education, patient experience, and clinical research. The work of the panel was used to develop a roadmap, which was adopted by consensus, and which will serve to guide the AACD moving forward.

Keywords Needs · Gap · Resident · Cosmetic · Dermatology · Education

Introduction

Cosmetic and laser dermatology are growing components of graduate medical education in dermatology and an increasingly large part of clinical services at academic medical centers. Nationwide, in 2019, dermatologists performed 3.9 million neuromodulator and soft tissue filler injections, 4 million laser, light, and energy-based procedures, and 1 million body sculpting treatments [1]. A proportion of these procedures occurred in academic settings, where fellowship trained and skilled cosmetic dermatology faculty worked with dermatology residents to provide cosmetic surgery care to a diverse group of patients. Collaboration among cosmetic dermatology faculty, dermatology residents and fellows, and the academic medical center is necessary to ensure optimal clinical care both at the medical center and when trainees transition to independent practice [2–4]. In addition, academic cosmetic dermatologists are increasingly engaged in

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advancing clinical research regarding the causes of cosmetic complaints and their treatment.

Although cosmetic dermatology is a mature and well-defined subspecialty of dermatology, there is a lack of internal structure within academic institutions, the house of dermatology, and the house of medicine to support academic cosmetic dermatology for faculty, patients, and trainees. As the key national professional societies for laser and cosmetic dermatology, the American Society for Laser Medicine and Surgery (ASLMS) and the American Society for Dermatologic Surgery (ASDS) provide excellent support for cosmetic dermatologists in general, and through the ASDS Cosmetic Dermatologic Surgery Fellowship Program (CDSFP) and Surgical Directors Forum, also for teachers and learners. However, there is no organization that focuses solely on the needs of academic cosmetic dermatology [5]. This is in contradistinction to Mohs surgery, the other procedural subspecialty in dermatology, for which there have been national professional organizations dedicated to academic practice, historically the Association of Academic Dermatologic Surgeons, which about a decade ago became the Dermatologic Surgery Section of the Association of Professors of Dermatology (APD). Perhaps as a consequence, there are notable gaps that exist in how academic cosmetic dermatologists are supported by their institutions and departments, how clinical service delivery of cosmetic dermatology services occurs in academic settings, how residents and fellows are trained in cosmetic dermatology, and how clinical research relevant to cosmetic dermatology is encouraged [6–9].

To better support the growing field of academic cosmetic dermatology, including clinical care, research, residency training, and faculty development, the Association of Academic Cosmetic Dermatology (AACD) was founded in 2021. This group is the primary professional society for cosmetic dermatology faculty at medical schools and academic medical centers. The AACD aims to elevate cosmetic dermatology by: (1) empowering cosmetic dermatology to improve cosmetic and laser education for dermatology residents; (2) raising the quality of cosmetic clinical services provided to patients presenting for care at academic centers; and (3) facilitating the performance of collaborative research to advance cosmetic dermatology.

To better understand the challenges facing academic cosmetic dermatology, the AACD convened an expert panel to clarify the relevant needs and gaps and suggest remedies. The resulting roadmap was then adopted by consensus by AACD.

Methods

Convening of Expert Panel

The AACD expert panel included academic dermatologists who were fellowship-trained in cosmetic dermatology or whose clinical practice and experience has been predominantly in cosmetic and laser dermatology, as well as program directors who help oversee and implement residency training programs. All panelists were American Board of Medical Specialties (ABMS) board-certified dermatologists, typically identified by their respective department chairs as primary teaching faculty in cosmetic dermatology for a US ACGME-accredited dermatology residency program.

Drafting of the Roadmap

The expert panel convened virtually in October 2021. During this meeting, panelists were each randomly assigned to consider unmet needs and gaps in one of three domains: resident education, patient experience, and clinical research. Each participant was provided an opportunity to share their thoughts, and after each had spoken, discussion ensued. The proceedings of each workshop were recorded and transcribed. Upon conclusion of the workshops, the entire panel reconvened, and the salient findings from each workshop were reviewed, discussed, and further refined to develop a draft roadmap.

Approval of the Roadmap

The draft roadmap was circulated to all expert panel members,[1] all members of the AACD Board of Directors,[2] and

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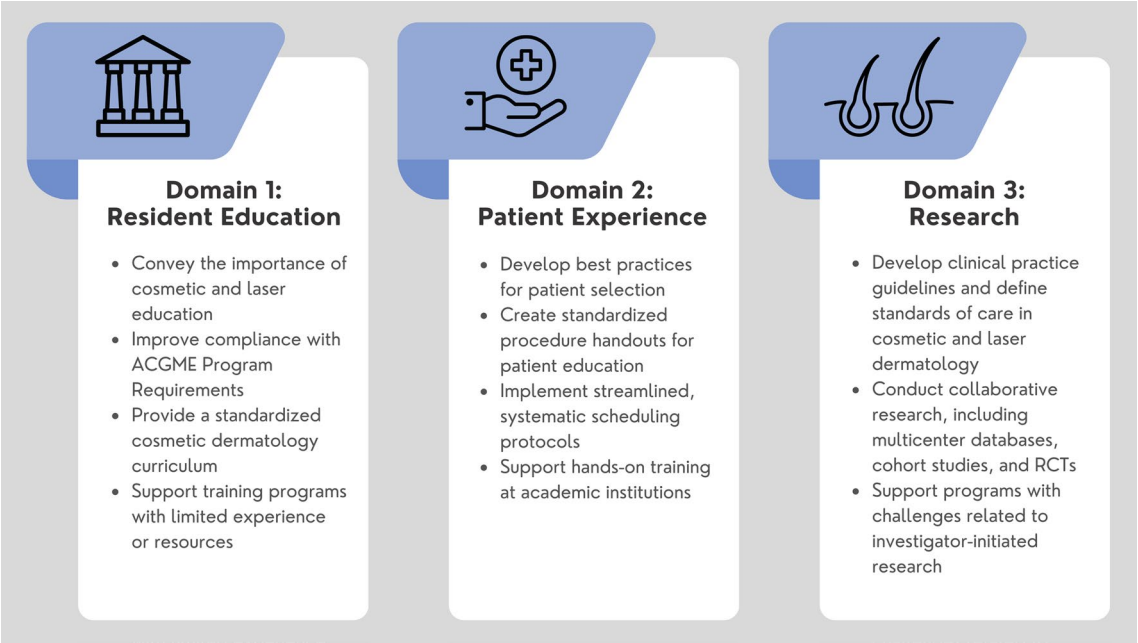

Fig. 1 Roadmap for the Association of Academic Cosmetic Dermatology (AACD). *ACGME* Accreditation Council for Graduate Medical Education, *RCT* randomized controlled trial

all committee chairs and co-chairs.[3] The roadmap was iteratively reviewed and edited until consensus was reached.

Results

A summarized roadmap is presented in Fig. 1.

Domain 1: Resident Education

As many department leaders and residency program directors remain uncertain as to why cosmetic and laser instruction is important for academic dermatology programs, and why residents need to learn these aspects of dermatology, the reasons for such training must be better and more convincingly articulated. Concurrently, it is also necessary to identify potential barriers to compliance with ACGME Program Requirements for Graduate Medical Education in Dermatology if requirements for resident training in cosmetic dermatology are enhanced or expanded. Strategies then may be developed to mitigate these barriers so that the overall resident education in cosmetic dermatology can be improved.

At present, the ACGME requires that residents "demonstrate knowledge of indications and contraindications for, and complications and basic techniques of elective cosmetic dermatology procedures, to include chemical peels, dermabrasion, hair transplants, invasive vein therapies, liposuction, scar revision, and sclerotherapy" [10]. Residency programs are required to provide didactic instruction on "topics relating to cosmetic techniques" and clinical exposure to "a wide range of lasers and other energy sources." The resident must also be physically present for a number of cosmetic procedures, including botulinum toxin and filler injections [11], as well as laser procedures [10]. There was consensus among the panel members that these thresholds could be reconsidered to further enhance resident cosmetic training. Given the limited number of available training cases, that it may be infeasible to expand time in surgery per resident, and that resources and faculty complements vary across training programs, an effort should be made to discover what can be done to enhance current requirements that can be reachable by all or nearly all programs and trainees [12].

There is a great deal of variability in how residents are trained in cosmetic dermatology and dermatologic surgery, and this may be in part dependent upon how supportive each residency program is of cosmetic dermatology [3, 4]. A standardized cosmetic dermatology education for residents (e.g., standardized curriculum, with online lectures or videos) would help ensure that all dermatology residents have

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sufficient cosmetic didactic training. Additionally, expansion of didactics in cosmetic dermatology by these means would not place undue stress on those programs with fewer faculty available to provide didactics. Expanded lecture and discussion series in cosmetic dermatology would also support residents who choose to incorporate cosmetic procedures in their clinical practices after the completion of residency.

Although a standardized curriculum across programs would be useful, program-specific efforts may also be helpful [13]. Programs with limited endogenous faculty experience in cosmetic dermatology or limited resources to purchase energy devices and other cosmetic procedure equipment may require additional support. Diverse methods must be considered in such cases, to subsidize the use of space, supplies, devices, products, faculty, and other relevant resources. Individual programs may also help in developing plans that are both feasible and compliant with local GME rules and ACGME cosmetic training requirements.

A resident curriculum on cosmetic dermatology should also focus on not only the treatment indications and techniques, but also the avoidance and management of adverse events. With the rise in the number of cosmetic procedures being performed by non-dermatologists and non-physicians, including practitioners with minimal training, the risk has grown that a patient treated by a less qualified provider will suffer a procedure-associated adverse event. Indeed, adverse event registries such as ASDS-Northwestern Cutaneous Procedures Adverse Events Reporting (CAPER) have been developed to track such cosmetic procedure-related complications [14]. As the leaders in the creation and refinement of many minimally invasive cosmetic procedures, including laser procedures, filler and neurotoxin injections, subcision, sclerotherapy injections, endovenous ablation, and hair transplants, it is important for dermatologists to remain at the forefront of training the next generation of dermatologists in the safe provision of these interventions [15].

While sometimes overlooked, it is important to understand that so-called cosmetic dermatology skills are routinely deployed in the academic setting to treat the cosmetic sequelae of medical skin conditions. For instance, consider ablative fractional laser for increasing the mobility of burn scars, fillers for HIV lipodystrophy and localized scleroderma, neuromodulators for hyperhidrosis, hair removal for hidradenitis or gender affirming surgery, laser-assisted drug delivery, vascular laser for telangiectasia associated with Osler-Weber-Rendu syndrome, pulsed dye laser for port-wine stains, laser for psoriasis and vitiligo, and carbon dioxide laser ablation for actinic cheilitis. To the extent residents can be trained in cosmetic procedures, they will also develop the skills to take better care of their medical dermatology patients who require such procedures. At the very least, cosmetic dermatology education in residency will make trainees aware of the existence of cosmetic options for medical dermatology patients. Thus, even if they choose not to perform these themselves in post-residency practice, they can appropriately refer their patients to appropriate colleagues.

The availability, training, and expertise of faculty who are both interested in and comfortable with teaching a wide range of cosmetic and laser procedures is also important. Some programs have full-time faculty devoted to cosmetic dermatology education, while others may refer residents and patients to outside dermatology practices for teaching workshops or cosmetic elective rotations headed by volunteer faculty. Though trainee experience observing procedures is important and can be extremely helpful when the volunteer faculty are highly experienced, additional benefits are associated with hands-on cosmetic training, which due to malpractice insurance coverage and regulatory issues, can usually only be provided at the academic institution. Hands-on training in house offers continuity of care as well as the opportunity to collaborate with other departments, such as plastic surgery, oculoplastics, facial plastic surgery, and otolaryngology.

Domain 2: Patient Experience

Optimizing the patient experience in cosmetic and laser dermatology requires understanding the needs and preferences of the patient, but also the capacities and propensities of faculty, staff, and trainees. Patient experience may be impacted by the effectiveness of patient education, appropriate patient selection of procedures, prompt and accommodating scheduling, running on time, adequacy of staff support, sufficiency of devices and technical resources to provide necessary care, and availability of faculty to support trainees who may be the first-line care providers.

Patient education is an essential aspect of the patient experience and improves patient satisfaction and treatment outcomes [16]. Barriers to patient education include time constraints, medical literacy, and limited resources. Resources for patient education, including care instructions for before and after treatment, informative videos, and handouts will help to keep patients informed and engaged. Satisfied patients may be more willing to interact with trainees.

Correct patient selection is also extremely important and can be challenging. As patients at a resident continuity clinic may be seen by a different attending physician at each visit, special efforts must be undertaken to ensure consistency regarding which procedures are recommended to individual patients. Faculty and residents must be attuned to patient preferences and expectations but also consider various factors that make each patient an appropriate candidate for a given procedure [17]. These considerations may be related to the procedure (e.g., energy-based body contouring may be more appropriate for mild to moderate skin sagging, while more

invasive procedures may be more effective for severe skin sagging) or to the patient (e.g., further evaluation may be required in patients at risk for body dysmorphic disorder). Defining best practices for patient selection may address this gap.

Suboptimal patient scheduling and checkout may have repercussions for an entire practice. Scheduling issues may need to be resolved based on local circumstances as there is substantial variation in patient flow across academic centers. Differences in scheduling for dedicated cosmetic clinics among programs include when patients arrive (e.g., at staggered times or several at one time), when clinics occur (often on a certain day/time, or after hours), and whether payment needs to be taken (e.g., nominal fee versus no charge). Some institutions may need assistance to develop streamlined, systematic scheduling and checkout protocols. Additional resources, including dedicated staffing, may be required. Differences in optimal scheduling of cosmetic patients versus other medical or surgical dermatology patients may need to be explained to administrators and faculty leaders. In particular, many academic cosmetic practices that are part of large academic centers rely on call centers or centralized scheduling that poses challenges for an academic cosmetic practice. Like many specialty clinical services, cosmetic dermatology can only flourish with certain dedicated resources and specific clinical protocols.

A problem that frequently affects academic cosmetic dermatology practices is insufficiency of devices and equipment. While neuromodulator and filler injectables are simple, disposable devices, lasers and energy devices are not. Each laser or energy device is a major capital investment, and at least 3 to 6 such devices are the minimum requirement for a comprehensive cosmetic dermatology practice. Since lasers are highly complex devices, each requires a service contract, which is typically approximately 10% of the cost of the laser per year, so that it can receive routine preventive maintenance and be promptly repaired when it malfunctions. While academic medical centers frequently delegate equipment repairs to an in-house vendor skilled at general equipment repairs, the specialized parts and expertise required for laser maintenance mandate a service contract with the manufacturer. Finally, lasers become obsolete every few years. They must then be replaced with newer models or devices for the same indication that employ entirely novel technologies. Cosmetic dermatology patients, like other sophisticated patients presenting to the academic medical center, expect to be treated with the latest, most effective, and safest equipment.

Lack of sufficient and standardized staff training, including instruction in customer care and optimal service provision, may interfere with the patient experience. One potential solution is creating standardized handouts for various procedures that are useful for everyone, including call center and clinic staff, residents, and faculty.

Another challenge in academic cosmetic dermatology practices is the nuanced relationship that has to be negotiated with industry in the use of products provided for resident training. Similarly, there are potential issues of ethics and professionalism related to a consumer-driven, self-pay, non-medical service line. For instance, policies may be needed to ensure a uniform approach regarding when free treatment or discount pricing may be allowed, as versus full pricing. Further challenges arise regarding selections of patients for training, which can lead to issues of "fairness," regarding who, often an employee, may serve as a demonstration or training patient.

Domain 3: Research

The promotion of rigorous high-quality research in cosmetic dermatology can lead to discoveries that result in safer, more effective, and more evidence-based patient care. Moreover, the incorporation of aggregated research findings into clinical practice guidelines may culminate in dramatically better outcomes, a decrease in avoidable adverse events, more appropriate patient selection, and hence elevated patient satisfaction and quality of life. Given the rapid evolution of the field and limitations in funding for cosmetic dermatology research available from private and public donors and agencies, there are many important clinical questions that remain to be investigated.

At present, the approach to the cosmetic or laser patient is typically individualized, perhaps to a greater degree than in other medical contexts given the inherently larger role of patient preference. Encouragement of research advances would not detract from the very personalized nature of cosmetic treatments, with patients and physicians still able to work together to tailor each treatment plan to accommodate the patient's needs and wants.

Localizing relevant clinical and translational research in dermatology departments also provides an opportunity for residents and fellows to become involved in research and learn research methods. Some residents may find research in cosmetic dermatology particularly satisfying, opting to subsequently pursue careers that include a research component. Other trainees exposed to research who are less interested in continuing such work in the future may still make significant contributions to the growth of knowledge and to better understand the limitations of current cosmetic dermatology therapies. Trainee participation in research may thus improve their proficiency in cosmetic dermatology, and likely their overall satisfaction with cosmetic dermatology education.

Collaborative research initiatives that will be undertaken by the AACD include multicenter databases for collection of routine data; multicenter cohort studies; randomized, controlled clinical trials; and the development of clinical

practice guidelines for cosmetic and laser dermatology. The Association of Academic Cosmetic Dermatology additionally hopes to develop tools to help individual institutions overcome obstacles related to investigator-initiated research (e.g., assisting with Institutional Review Board [IRB] applications), particularly research without external funding. Academic cosmetic dermatologists may be especially eager to participate in research regarding cosmetic therapies for those with medical conditions. As many affected medical dermatology patients who could benefit from cosmetic interventions, such as transgender patients and those with connective tissue disease, are already being cared for at academic medical centers, the academic center may be the optimal locus for research aimed at refining and improving these directed cosmetic procedures.

Conclusion

Cosmetic and laser dermatology are important subspecialties of dermatology. Adequate resident education in these areas is essential for training dermatologists who are well-equipped to address the entire spectrum of patient needs. Expert cosmetic and laser dermatology faculty members should direct resident and fellow education, work to improve the quality of clinical care delivery in the academic setting, help advance clinical and translational research, and advocate for cosmetic dermatology both within dermatology and externally. The extent to which academic cosmetic dermatologists are successful will impact patient outcomes, the rate of future progress in the field, and the availability of expert cosmetic dermatology care from a board-certified dermatologist.

Author contributions KM, BYK, SAI, and MA conceptualized and designed the study. MA, KM, BYK, and SAI drafted the manuscript. REC, NA, MAD provided administrative support. All authors participated in critical revision of the manuscript for important intellectual content.

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Availability of data and materials Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Declarations

Conflict of interest Murad Alam is Editor-in-Chief of *Archives of Dermatological Research*. Anna Bar is a consultant for Regeneron Pharmaceuticals Inc. Travis Blalock is a principal investigator for Castle Biosciences LLC. Diana Bolotin is a principal investigator for Replimune Group Inc. M. Laurin Council has been a consultant for AbbVie/Allergan Aesthetics, Sanofi-Genzyme/Regeneron Pharmaceuticals Inc, and Castle Biosciences LLC. Nour Kibbi is a principal investigator for Castle Biosciences LLC. Alison Bruce is an advisor for Mithra Pharmaceuticals SA. Shradda Desai receives honoraria from Alma Lasers and is a consultant for Level Ex Inc. Deirdre Hooper has served on the advisory board for Allergan Aesthetics, Castle Biosciences LLC, Crown Laboratories Inc, Vichy Laboratories, DermTech, Endo Aesthetics LLC, Evolus Inc, and Revision Skincare; as a consultant for Allergan Aesthetics, Galderma SA, and Mayne Pharma Group Limited; and as an investigator for Allergan Aesthetics, Endo Aesthetics LLD, and Galderma SA. Deirdre Hooper has ownership interest with CollPlant Biotechnologies Ltd and Supergoop LLC; has received honoraria from Allergan Aesthetics and Galderma SA; and is an active clinical trial investigator for Arcutis Biotherapeutics, Cara, Dermavant Sciences Inc, Endo International plc, Galderma SA, Incyte Corporation, Taro Pharmaceutical Industries Ltd, UCB SA, Menlo Therapeutics (VYNE Therapeutics), Novan Inc, Bellus Medical, Brickell Biotech Inc, Asana Biosciences, Sun Pharmaceuticals Inc, AnaptysBio Inc, Affibody AB, BioPharmX Inc, Sol–Gel Technologies Ltd, Kiniksa Pharmaceuticals. Jenny Hu is a consultant for Regeneron Pharmaceuticals, Inc. Jayne Joo is a stockholder of Revance Therapeutics. Kristen Kelly is a consultant for Shanghai Fudan-Zhangjiang Bio-pharmaceutical Co., Ltd, Syneron/Candela Medical, Sciton Inc, and IQVIA Inc; has received research grants from BioPhotas Inc and Orlucent Inc; has had research supported by Allergan Aesthetics, the American Society for Laser Medicine and Surgery (ASLMS), the National Institutes of Health (NIH), the Sturge Weber Foundation, and University of California Irvine Institute for Clinical and Translational Science (ICTS); and equipment has been provided to the Department of Dermatology at University of California Irvine by Solta Medical; Syneron/Candela Medical; ThermiGen LLC; Michelson Diagnostics Ltd, and Sciton Inc. Edit Olasz Harken is co-founder of Harken Derm skin care. Melissa Shive served as a consultant for IQVIA Inc. Ronald Sulewski has received honoraria from Castle Biosciences LLC. Amanda Suggs is a medical advisor for Skinintelligent, and a medical consultant and advisor for MaryKay. Neelam Vashi is a consultant for Procter & Gamble, Janssen Pharmaceuticals Inc, and Pfizer Inc. Mara Weinstein Velez has been an investigator for Solta Medical Inc and ALASTIN Skincare Inc, and has received honoraria from ALASTIN Skincare Inc, Cynosure LLC, and SofWave Medical Ltd.

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