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Title

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Journal

Dermatology Online Journal, 31(2)

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Publication Date

2025

DOI

10.5070/D331265287

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Peer reviewed

Pearls for dermatology resident education in cosmetic and laser procedures

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Keywords: cosmetic, curriculum, education, proficiency, resident

Dermatology Online Journal

Vol. 31, Issue 2, 2025

Abstract

Comprehensive education in cosmetic and laser procedures is fundamental during dermatology residency to meet the demand for cosmetic medical procedures and effectively treat a myriad of complex dermatological conditions. This article highlights the importance of structured learning to provide step-wise opportunities for proficiency throughout residency. Although reading assignments and didactic sessions create a solid foundation, focused workshops, resident cosmetic clinics, and offsite electives serve as important experiences for residents to practice hands-on skills. This article provides guidance for curriculum development and establishing hands-on procedural learning. Additionally, the importance of joining professional societies to receive unique training as well as mentorship is highlighted. Having a structured and comprehensive cosmetic curriculum will equip dermatology residents with the toolkit to successfully care for diverse patient needs effectively and safely.

Introduction

There is a growing demand for cosmetic and laser procedures.¹ Beyond aesthetic appeal, dermatological procedures can manage cosmetic sequelae of various medical dermatologic conditions, such as filler injection for HIV lipodystrophy, neurotoxin injection for hyperhidrosis, laser resurfacing for radiation sequelae in cancer patients, and laser hair removal for gender-affirming care.^{2,3}

Board-certified dermatologists guide patient decisions regarding cosmetic and laser treatments, as well as perform these procedures.⁴ To meet the rising demand, the need for dermatology residents to receive comprehensive training in cosmetic treatments is pressing. Majority of dermatology residents plan to incorporate these procedures including injectables and energy-based devices into their practice.^{5,6} Even dermatologists who do not perform cosmetic procedures must be familiar with the identification and management of adverse events.^{7,8}

Requirements for dermatology resident education, as defined by the Accreditation Council for Graduate Medical Education (ACGME), have not yet addressed the new needs in the evolving landscape of dermatological practice. Dermatology programs must, at the minimum, pro-

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vide residents with didactic education and observation of common cosmetic procedures. ACGME does not require dermatology residents to receive hands-on training.^{9,10} By contrast, the ACGME mandates that plastic surgery residents receive hands-on training in aesthetic procedures, including laser, neurotoxin injection, filler injection, and fat grafting.¹¹ Although the majority of cosmetic directors at dermatology residency programs agree that the ACGME should have minimum requirements for hands-on cosmetic procedures, it may be difficult for residents at all programs to achieve set minimums, particularly if programs do not have a cosmetic director.¹²

There is great variability in how cosmetic training is delivered across dermatology residencies.^{12,13} Herein, a subcommittee of cosmetic directors from the Association of Academic Cosmetic Dermatology (AACD) describes pearls for resident education, based on experiences across many residency programs. However, each residency program has its own culture, challenges, and resource limitations. The curriculum described here can be successful when applied to the appropriate training environment and can be adapted to the needs of the individual program.

Discussion

Defining a cosmetic curriculum

It is helpful to define a cosmetic and procedural dermatology curriculum within the residency program ([Table 1](#)) to include clear objectives and milestones that increase in complexity as residents advance to higher post-graduate years.¹⁴ There should also be a defined plan to assess resident competence. Tools such as the Objective Structured Assessment of Technical Skills are helpful to measure resident progression and to provide objective feedback.¹⁵

For programs without an existing cosmetic curriculum, it may be helpful to connect with other similar size residency programs with an established curriculum. Cosmetic education faculty can explore AACD membership for networking opportunities, including participation in committees and the AACD Cosmetic Mentorship program.

Reading assignments and didactic education

Residency programs are encouraged to include didactics in the curriculum to establish a strong foundational understanding of cosmetic and laser procedures. Key topics including anatomy, patient selection, safe and effective techniques, and adverse events of cosmetic procedures should be covered. Incorporating didactics into case presentations or prior to relevant cosmetic teaching workshops can be effective. Didactics can be led by faculty or volunteer attendings or be a teaching opportunity for cosmetic or Mohs surgical fellows and upper-level residents. AACD offers a suggested reading list for residents (<https://theaacd.org/resident-reading-list/>) and editable

slide decks for faculty (<https://theaacd.org/lectures-and-slide-decks/>).

Providing hands-on training

Hands-on training is a key component of learning procedural skills. Various methods exist for offering hands-on experience while ensuring sufficient faculty supervision.

Practice model (type of faculty supervision and cost to patients)

An AACD subcommittee has defined 9 practice models in which residents provide hands-on cosmetic care to patients, stratified by type of faculty supervision and cost to patients¹³ ([Table 2](#)). Faculty-supervised cosmetic teaching workshops with volunteer patients are a common practice model (provided at >85% of ACGME-accredited dermatology residency programs¹³). The appropriate curricular model depends on faculty availability. As teaching workshops are often held outside of regular clinic hours, these may be appropriate at programs in which faculty and staff are available after hours. At programs with continuity clinics that have cosmetic faculty preceptors and patients who are good procedural candidates, it may be appropriate for training to occur during pre-scheduled times.

Cost to patients is also important to consider. Offering reduced prices or free treatment, if feasible, can recruit patients who may otherwise prefer to be treated by faculty.¹⁶ Additionally, reduced cost clinics can improve patient access.

Location of Training

Hands-on training typically occurs at the residency outpatient clinical facilities.¹³ However, some programs, particularly those without dedicated cosmetic faculty or limited training equipment, may partner with local private practice providers for offsite training. Although providing both onsite and offsite options can improve resident exposure to diverse techniques and patient populations, there may be additional medical-legal challenges to consider associated with residents training in private practice settings.

Procurement of devices and products

Residency programs encounter cost barriers when establishing cosmetic clinics, especially if procedures are offered at a discounted price. Fortunately, solutions exist. Residencies can receive products, including neurotoxins and fillers, through education grants or manufacturer donations. If the institution does not allow for such donations, departments can consider these costs as an educational expense or charge patients for treatment. Proper labeling and storage of products are essential to streamline clinic operations and minimize waste, thus reducing costs. If permissible by the institution or pre-mixed by institutional pharmacy, a single vial of neurotoxin can be

Table 1. *Components of a cosmetic curriculum.*

Component	Notes
Learning aims, goals, and objectives	Provide clear goals for various procedures including relevant anatomy, informed consent, planning, and technique.
Milestones	Increase complexity throughout PGY-training years (e.g. PGY2: assisting with neurotoxin, filler, and laser; PGY3: performing cosmetic procedures; PGY4: developing cosmetic treatment plans)
Plan for assessing resident competence	Define how, when, and for which procedure(s) and skills competence will be measured. Consider tools such as OSATS (Objective Structured Assessment of Technical Skills) to measure resident competence and progression in procedural skills.
Reading assignments	Assigned reading materials may include both journal articles and book chapters (e.g. Resident Reading List at https://theaacd.org/resident-reading-list/).
Didactic education	Lectures may be given by faculty within the department, as well as through online lectures and virtual learning platforms (e.g., from medical professional societies such as the AACD).
Observational training in procedures	Observing faculty-appointed clinics, ideally with a variety of providers and in a variety of settings, improves resident understanding of the range of practice styles, patient populations, and treatment options (e.g. observing hand placement for neurotoxin, filler, and laser; setting realistic expectations).
Hands-on training in procedures	On-site options include faculty supervised cosmetic teaching workshops, faculty supervised resident-appointed continuity clinics, and faculty-appointed clinics with residents assigned. Off-site options include hands-on training sessions sponsored by medical professional societies and external rotations.

Table 2. *Nine types of practice models for hands-on cosmetic training, stratified by type of faculty supervision and cost to patients, as defined by the Association of Academic Cosmetic Dermatology (AACD). Adapted from Minkis et al.¹³*

Cosmetic workshops
Faculty supervised cosmetic teaching workshop with volunteer patients. Faculty supervised cosmetic teaching workshop with patients paying discounted cosmetic prices. Faculty supervised cosmetic teaching workshops with patients paying regular cosmetic prices.
Resident continuity clinics
Faculty supervised resident-appointed continuity clinics with volunteer patients. Faculty supervised resident-appointed continuity clinics with patients paying discounted cosmetic prices. Faculty supervised resident-appointed continuity clinics with patients paying regular cosmetic prices.
Faculty clinics
Faculty-appointed clinics with residents assigned and volunteer patients. Faculty-appointed clinics with residents assigned and patients paying discounted cosmetic prices. Faculty-appointed clinics with residents assigned and patients paying regular cosmetic prices.

used on multiple patients and can be refrigerated or re-frozen for at least one month.¹⁷ For devices, multiple departments can share a device to help offset costs. Pro-

grams can also reach out to community practices to loan a device.

Patient selection and recruitment

To ensure clinic success, it is helpful to include patients who are willing to be treated by residents. Recruiting co-residents, friends, family, and clinic staff can help. This allows for an approachable environment to teach and ask questions and to receive feedback with the opportunity for closer follow-up of patients and results. It also allows residents the opportunity to fully explain a procedure and describe what patients can expect before, during, and after a procedure.¹⁸

Recruiting regular clinic patients (eg, faculty clinics, resident continuity clinics, or referrals from other subspecialties or departments) is another method. It may offer improved patient diversity and allow residents to refer patients who can benefit from restorative cosmetic dermatological procedures. Discounted procedures can also improve patient access and offer an opportunity to give back to the community.

Patient expectations

Teaching residents effective patient communication and setting realistic expectations is key. Even when treating friends and family, residents should engage in formal discussion covering expected outcomes, treatment technique, risks, benefits, and possible complications. Residents should have a solid understanding of the procedure and feel comfortable obtaining consent.¹⁸ Documentation and before-and-after photos are neces-

sary to help show progress or assist with troubleshooting.

Adverse events

Finally, effective complication management is necessary. Prior to the clinic, comprehensive plans should address both immediate and delayed complications. Defined roles need to be determined if problems arise, so patients can be treated promptly in the post-procedure period.¹⁸ These plans will allow residents to focus on the patient and learn procedures in a safe environment.

Institutional regulations

In establishing an academic cosmetic practice, institutional regulations which vary greatly, can pose challenges. These regulations, influenced by local legislature and institutional leadership may impact device and product acquisition, cost to patients, available treatments, and more. Negotiating with leadership to successfully adopt desired resident education strategies may include discussing strategies to manage conflicts of interest, cost to patients, and safety of off-label cosmetic procedures. Seeking mentorship from colleagues within and outside the institution, such as the AACD Cosmetic Mentorship program, can help navigate these challenges.

Faculty-supervised cosmetic teaching workshops

Faculty-supervised cosmetic teaching workshops provide unique hands-on training opportunities wherein residents are the primary physician in their patients' care, while faculty provide supervision. Faculty supervisors typically reside within the dermatology department, but other options include volunteer faculty and faculty from related subspecialties, such as otolaryngology, facial plastics, and plastic surgery.

Cosmetic workshops

The workshops can be structured based on program resources, staff, and culture ([Table 3](#)). It is important to create an environment in which observation and questions are welcomed. In a procedure-based workshop, residents have didactics and board review followed by clinic, which can be focused on one device or procedure. Examples may include neuromodulators, fillers, or lasers and other energy-based devices. In a theme-based workshop, the didactics and clinic are limited to one concern such as acne scars or perioral rhytids. These models allow the residents to focus on one procedure or concern and improve their skill through repetition. However, there needs to be sufficient patients and supplies for the residents to learn. With this model, resident absence on that training day leads to the problem of missed content.

Additional considerations

To provide a variety of procedures in a single clinic, specific time slots for various procedures can be created or a modified resident-only clinic schedule can be used.¹⁸ This provides a realistic clinic day and allows residents to continue practicing these skills throughout the year. With time slot scheduling, however, this is not a patient-centered calendar, and there may be waiting lists for certain procedures.¹⁸ This is in contrast to the typical patient-centered calendar. Therefore, some days may be more varied than others, and residents may have difficulty practicing rare or complex cases. It may be cumbersome to implement based on the practicality of scheduling.

Outside resources

Although learning cosmetic procedures during dermatology residency is ideal, resident cosmetic clinics may not be feasible for every program and some residents may desire more than what is offered. In these scenarios, the trainees can still pursue additional training in cosmetics and lasers through offsite rotations and engagement in professional societies.

Interdepartmental and offsite rotations

Rotating through related specialties and offsite practices is an effective method of providing additional training. If hands-on opportunities are not available, residents can learn how physicians develop and communicate a cosmetic treatment plan, practice hand placement for procedures, discuss safety concerns, and review complications management with patients. Additionally, rotating in another clinic setting allows residents to evaluate how a clinic that regularly performs cosmetic procedures works in daily operations.

Medical professional societies

Finally, there are abundant resources to learn about cosmetic dermatology through professional societies, including the AACD, American Society for Dermatologic Surgery, American Society for Laser Medicine and Surgery, American Academy of Dermatology, Skin of Color Society, and Women's Dermatologic Society. These societies offer online learning resources and hands-on experiences. Professional societies can offer waived or reduced membership and meeting fees for residents, access to dermatology journals, opportunities to get involved in committees and leadership, online journal clubs, and mentorship programs. Compiled lists of these various resources are available through the AACD (<https://theaacd.org/resident-resources/>) and ClubDerm (<https://clubderm.com/>).

Table 3. *Example models for faculty-supervised cosmetic teaching workshops.*

	Device/ Procedure Based	Theme Based	Time Slots	Normal Clinic Schedule
Potential Strengths	<ul style="list-style-type: none"> · Single procedure (i.e., pulsed dye laser) · Repetition 	<ul style="list-style-type: none"> · Primary concern (i.e., rosacea) · Repetition · Learn multiple ways to treat primary concern (i.e., intense pulsed light vs. pulsed dye laser for rosacea) 	<ul style="list-style-type: none"> · Variety 	<ul style="list-style-type: none"> · Variety
Potential Weaknesses	<ul style="list-style-type: none"> · Only one day for a procedure · Recruiting sufficient patients · Obtaining sufficient product 	<ul style="list-style-type: none"> · Only one day for a procedure · Recruiting sufficient patients · Obtaining sufficient product 	<ul style="list-style-type: none"> · Patients may wait longer for certain procedures 	<ul style="list-style-type: none"> · Dependent on patients · May not see more complex procedures

Conclusion

Through a well-structured curriculum consisting of didactics and hands-on learning, residents can prepare to meet the growing demand for cosmetic medical procedures. Furthermore, access to additional training and mentorship via professional societies can enhance their clinical readiness. This comprehensive training will ensure residents are confident in their skills following residency to provide high-quality patient care.

Potential conflicts of interest

The authors declare the following potential conflicts: Shraddha Desai is a consultant for Alma Lasers, Inc. Carlos Wambier has served as consultant for Vyndence Medical, Daniel Alain, Chemistry Rx, Incyte, and Allergan Aesthetics (an Abbvie Company). Speaker of Galderma Laboratories, Cynosure, and Pfizer Inc. Cosmetic Dermatologic Surgery Editor of the Surgical & Cosmetic Dermatology Journal, Brazilian Society of Dermatology.

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