



Review

The show must go on: Dermatologic procedural education in the era of COVID-19



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ABSTRACT

COVID-19 procedural restrictions and concerns from both practitioners and patients have led to a decrease in cosmetic procedures performed. Reduced clinic space, the necessity of distancing between people, and patient preference for a smaller care team may restrict trainees from observing, assisting with, or performing procedures. Thus, trainees may be limited in their ability to learn, practice, and meet the required number of cases to achieve competence, subsequently necessitating a sustained demand for alternative methods of learning. In this review, we examine the efforts made thus far by both dermatologists and dermatology organizations to meet the educational procedural needs of trainees and compensate for limitations during the pandemic and highlight areas in which innovation may still be needed.

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Introduction

Nearly every aspect of the practice of dermatology has been affected by the COVID-19 pandemic. Many dermatologists have implemented the usage of telemedicine, and in the academic environment there has been a transition to virtual education

(Oldenburg and Marsch, 2020). Virtual education in procedural dermatology is a particularly unique challenge because the teaching of procedures is often based on the dictum “see one, do one.”

Current challenge

As dermatology clinics shift back to more in-person care, changes at procedural clinics will be made according to safety

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considerations with respect to COVID-19 transmission, with a focus on nonaerosolizing, medically indicated, and low plume-forming procedures. Surgical plume, produced during the thermal destruction of cells, comprises 95% water and 5% particulate matter, exposing the respiratory tract to toxic organic compounds and infectious particles (Katoch and Mysore, 2019). In particular, transmission of the novel coronavirus can occur via direct and indirect contact with infected individuals, surfaces, or objects used on the infected individual (Ong et al., 2020). Therefore, electro-surgical devices and laser therapy may increase the likelihood of COVID-19 transmission through direct contact and aerosolization of viral particles. Thermal disruption of human cells may result in the release of cellular materials and pathogens, including the human immunodeficiency virus, human papillomavirus, hepatitis B virus, and bacteria (Emadi and Abtahi-Naeini, 2020; Garden et al., 2002; Sarnoff et al., 2018). Physicians and patients will need personal protective equipment (PPE), but standard surgical masks filter particulate matter >5 µm in size and are unable to protect against electro-surgical and laser plume. Therefore, N95 masks will be required during these procedures (Katoch and Mysore, 2019).

Although physicians may safely wear masks during cosmetic procedures, certain facial procedures, such as dermal fillers and laser hair removal of the upper lip, prevent patients from doing the same. When working on the face or oral mucosa, pre-testing and proper PPE, such as N95 and surgical masks and face shields, will help minimize infection. However, many hospitals and patients do not have access to such PPE (Glenza, 2020; Ranney et al., 2020). Therefore, nonessential procedures may be postponed or deferred to save and reallocate resources. COVID-19 procedural restrictions and concerns from both practitioners and patients will likely lead to a decrease in cosmetic procedures performed to minimize COVID-19 spread and conserve necessary resources. Reduced clinic space, the necessity of distancing between people, and patient preference for a smaller care team may restrict trainees from observing, assisting with, or performing procedures. Thus, trainees may be limited in their ability to learn, practice, and meet the required number of cases to achieve competence, subsequently necessitating a sustained demand for alternative methods of learning.

Existing virtual-learning opportunities to supplement resident procedural education

The Accreditation Counsel on Graduate Medical Education and the American Society for Dermatologic Surgery (ASDS) require der-

matology residents and cosmetic dermatologic surgery fellows, respectively, to demonstrate knowledge and proficiency in common cosmetic procedures, including botulinum toxin injections, soft tissue augmentation, and treatments with light, laser, and other energy-based devices (Table 1; Accreditation Counsel on Graduate Medical Education, 2020; ASDS, 2020). With in-person national meetings and review courses canceled, long-distance learning has come to the forefront.

Organizations such as the American Academy of Dermatology and the ASDS have created virtual procedural videos that may be used to achieve the number of cases necessary to meet required competencies or fill any gaps in training (Table 1). The ASDS also offers online structured didactics, a cosmetics case study series, a journal club, question banks, and live learning sessions using social media platforms. Physicians and residents may also access recorded lectures from prior annual conferences. In addition to organized teaching through national societies, leaders in cosmetic dermatology have initiated teaching sessions on social media platforms, such as Instagram, as a way to supplement education and share expertise. Moreover, residents in different programs have shown collegiality in sharing online resources with each other. Tables 1 and 2 include virtual resources, and Appendix A provides a more comprehensive list.

Call to action for collaboration to fill educational gaps in procedural training

Existing virtual educational materials may be amplified by creating a forum to share resources across institutions. Despite the proposed approaches to supplement procedural learning, the honing of procedural skills remains limited during the COVID-19 era. A thorough search of available ASDS, Women's Dermatologic Society, American Academy of Dermatology, and American Society for Laser Medicine and Surgery videos reveals gaps in procedural videos for microdermabrasion, as well as trichloroacetic acid/chemical reconstruction of skin scars and subcision techniques.

Virtual didactics administered through popular platforms, such as Zoom, may easily be recorded and, with permission from the lecturer, uploaded to a centralized forum. A task force could be created to commission the creation of additional content and compile existing learning materials. Online sessions should be evaluated to determine the optimal length and format choices for learning and to assess what factors of the presenting faculty engage viewers to allow for increased comprehension of the presented material.

The timeline for a return to pre-COVID-19 elective practice is highly uncertain; thus, a multi-institutional response to adapting

Table 1
Educational, safety, and feasibility for considerations for resident ACGME requirements.

ACGME case log category	Observe or perform	No. required	Plume potential?	Physician masked?	Patient masked?	Online resources available	Pay required to access
Excision: Benign or malignant	Perform	50	Yes*	Yes	Yes	Yes‡	No
Repair (closure): Simple/intermediate/complex	Perform	50	Yes*	Yes	No†	‡	No
Mohs micrographic surgery	Observe or perform	15	Yes	Yes	No†	‡§	Yes
Laser: Combined (ablative, nonablative, vascular)	Observe or perform	15	Yes	Yes	Yes	‡§	No
Botulinum toxin chemodenervation	Observe or perform	10	No	Yes	Yes	‡§	No
Soft-tissue augmentation/skin fillers	Observe or perform	5	No	Yes	No†	‡§	No
Flaps and grafts (split or full)	Observe or perform	13	Yes	Yes	No†	‡§	No
Nail procedures	Observe or perform	3	No	Yes	Yes	‡§	No

ACGME, Accreditation Council for Graduate Medical Education.
Table adapted from ACGME dermatology resident case logs (ACGME, 2020).
* If electrocautery is used.
† If facial procedure.
‡ American Society for Dermatologic Surgery procedural videos, lecture series, live webinars.
§ American Academy of Dermatology on-demand virtual meetings.

Table 2
Educational, safety, and feasibility for considerations for dermatology surgery fellowship requirements.

ASDS case log cosmetic dermatology Surgery Fellowship category	Procedure	No. required observed	No. required performed	Plume potential?	Physician masked?	Patient masked?	Online resources available	Pay required to access
Wrinkles and folds	Fat transfer optional Neuromodulators	180	60	No	Yes	No*	Yes ^{†‡}	No
Rejuvenation	Soft-tissue fillers Microdermabrasion Nonablative laser and light-based treatments Nonablative fractional resurfacing Chemical peels-light Platelet-rich plasma treatments	90	30	Yes	Yes	No*	†	Yes
Resurfacing	Microneedling Chemical peels-medium deep Ablative laser resurfacing Dermabrasion	30	10	Yes	Yes	No*	†‡	Yes
Veins	Fractional laser treatments Ambulatory phlebotomy Laser varicose vein surgery Pulsed-light therapy	100	35	Yes	Yes	Yes	†	No
Body contouring	Sclerotherapy Cryolipolysis Laser lipolysis Ultrasound/radiofrequency fat removal Tumescent liposuction Ultrasound/radiofrequency tissue tightening Other energy-based or chemical modalities	30	10	Yes	Yes	Yes	†‡	No
Lifting	Browlift Blepharoplasty Facelift Other lifting procedures	15	5	Yes	Yes	No*	†	No
Hair treatments	Hair transplantation Hair removal	22	8	Yes	Yes	No*	†‡	No
Scar revision	Fractional/vascular laser Keloid excision Acne scar excision (per session) Z-plasty Subcision TCA/CROSS Injection treatment	45	15	Yes	Yes	No*	†	No

ASDS, American Academy of Dermatology; CROSS, chemical reconstruction of skin scars; TCA, trichloroacetic acid.

Table adapted from ASDS cosmetic accreditation fellowship procedures (ASDS, 2020).

* If facial procedure.

† ASDS procedural videos, lecture series, didactics.

‡ American Academy of Dermatology on-demand virtual meetings.

education in the dermatology community is suggested. Through the collaboration of various dermatological organizations and medical institutions with the creation of a unique task force, procedural education may be reimagined in innovate ways to facilitate the training of outstanding procedural dermatologists in the coming months and years. The lessons learned from this effort may then guide future methods of remote learning for our field. Live online learning is not only tenable in dermatology, but also well received. The implementation of virtual learning may supplement in-person curricula in procedural dermatology so that all residents truly receive equal exposure and opportunities.

Conflicts of interest

None.

Financial disclosures

None.

Study Approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijwd.2020.11.002>.

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