

SPECIAL ISSUE ARTICLE

Dermatological procedures amidst COVID-19: When and how to resume

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Email: malcom.noronha@live.com**Abstract**

The pandemic of COVID-19 has captivated more than 3 million people across the globe affecting the dermatology practice as well. Due to the novel nature of the virus and concomitant lack of research, standard guidelines have not been set in place regarding the procedures. Currently, due to fear and spread of coronavirus aesthetic practice has taken a seat back. Dermatologic surgeon/aesthetician have to be prepared for the forthcoming alterations in the practice and adjust to the necessary precautionary methods. This articles aims to prepare dermatologist for the upcoming difficulties and precautions to be taken for conducting procedures in amidst of coronavirus.

KEYWORDS

aesthetic, coronavirus, COVID-19, dermatology procedures, laser, PPE

1 | INTRODUCTION

Coronavirus, an enveloped spherical or polymorphic RNA virus measuring 120 nm diameter has already infected more than 3 million people across the globe. Coronavirus derives its name from Latin word (corona—crown) appearance under electron microscopy due to presence of spikes on the envelope of the virus which acts as the site of attachment to host cells.¹

Spread of corona has captivated the whole world causing not only loss of lives but has entirely changed the lives of the people who are/will be surviving it. While all dermatology procedures fall in the category of nonessential or nonemergency procedures but at some point of time we dermatologist have to be prepared and decide on which procedures, when, how, and on whom to be done. This article attempts to prepare dermatologists for the upcoming changes and cautions in the practice.

Health is defined by World Health Organization (WHO) as a state of complete physical, mental, and social well-being and not merely the absence of the disease or infirmity.² Our face acts as a mirror to portray social confidence, self-esteem, and hence mental well-being of the patient. As dermatologists we will have to cater to the needs of the patients.

Chose the patient wisely and cautiously considering the following factors; rapid spread of virus, incubation period of 14 days when the

patient is asymptomatic but still transmitting the virus, more than 78% cases being asymptomatic,³ low sensitivity of the rapid test being 35% to 80%,⁴ uncertainty about the vaccine and drug for treatment of COVID-19, and upon that the worldwide scarcity of personal protective equipment (PPE) and masks.

The ideal time to start practice would depend on the rules laid down by local or central governing bodies but the most important factor is that the treating physician should be prepared both mentally and administratively, and be well informed about the current scenario. The prime thing would be to have a disinfection strategy in place and adequate supply of PPEs for protection for self and staff in the clinic.

2 | TRANSMISSION

Current information suggests that the two main routes of transmission of the COVID-19 virus are respiratory droplets and contact. Vertical transmission has also been reported.⁵ Respiratory droplets are generated when an infected person coughs or sneezes. Any person who is in close contact (within 1 m) with someone who has respiratory symptoms (coughing and sneezing) is at risk of being exposed to potentially infective respiratory droplets. Droplets may also land on surfaces where the virus could remain viable; thus, the immediate

environment of an infected individual can serve as a source of transmission (contact transmission). Although the role of aerosols in transmission is not very clear but there are studies which have demonstrated the potential of aerosolization of viral particles especially in closed environment or with high concentration of the virus.⁶ RNA of the virus has also been detected in anal swabs and blood samples of the infected patients.⁷

Studies have shown that severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) can survive on inanimate surfaces for 2 to 3 days.⁸ Potential fomites in the aesthetic clinic includes laser machine, laser plumes, spatula, eye shields, other surfaces like table top, bed, floor, switches, air conditioning draughts, or anything in the vicinity of the affected patients.

3 | DISINFECTION

Corona virus are RNA virus enveloped in lipid bilayer and has least resistance to germicidal effects of disinfectants as compared to bacterial spores, mycobacteria, non-lipid or small viruses, fungi, and vegetative bacteria in the decreasing order of resistance.⁹

Disinfection of laser machines should be done using sodium hypochlorite 1% or 70% ethyl alcohol solution before initiating and post procedure.¹⁰ Lens, optics, cooling tips, and touch screen should be cleaned with 70% ethyl alcohol before and after each treatment session.

The virucidal efficacy of chemical germicides against coronavirus has been investigated. A study of disinfectants against human coronavirus 229E found several disinfectants were effective after a 1-minute contact time; these included sodium hypochlorite (at a free chlorine concentration of 1000 and 5000 ppm), 70% ethyl alcohol, and povidone-iodine (1% iodine). A study also showed complete inactivation of the SARS coronavirus by 70% ethanol and povidone-iodine with an exposure time of 1 minute and 2.5% glutaraldehyde (GA) with an exposure time of 5 minute.¹⁰ Although GA is an effective disinfectant but it potential to cause severe allergic dermatitis and should be used cautiously. Studies have shown that SARS corona virus can survive on plastered walls, stainless steel surfaces, plastics, and even glass slides from 24 to 72 hours. It is stable in feces and urine for at least 1 to 2 days.^{8,11} Hence, all the surfaces should be disinfected as they can act as potential source of infection before commencing and after finishing the procedures.

4 | GENERAL PRECAUTIONS WHICH CAN BE TAKEN

- Waiting time before procedures can be limited by providing pre-procedure instructions through telecommunication, for example, to trim/shave the area for laser hair reduction, apply topical anesthesia 45 minutes before procedure which can be done easily at home if given proper instructions.
- Maximum 1 to 2 patients in the waiting area to be allowed with strict social distancing (gap of 6 ft), air conditioning should be avoided in waiting areas with proper cross ventilation and exhaust fan.

- At the main entrance of the clinic, sanitizer kiosk should be set up with staff wearing complete PPE (N-95 mask, gloves, and coveralls).
- Before patient enters the clinic, prescreening should be done with infrared thermometer and pulse oximetry; questionnaire for any symptoms of cold/cough/fever, including history of travel for last 2 weeks.
- Appointments should be given more widely apart than usual to assure time for disinfection of table top, chair, door handle, pad, paper, and any other equipment like dermoscope which comes in contact with patient's skin.
- Patient should be explained about the measures being taken in the clinic to prevent the transmission of the infection and only if patient is ready to comply by the same including wearing mask and/or gloves.
- Patient should be advised to come alone or with only one attendant and to carry minimum things which can be kept in a bag.
- Patient can send all old records via e-communication to clinic and similarly, digital prescriptions can be given in place of hard copies to minimize the chances of transmission.
- Disinfect the areas of contact with patient after each patient.¹²
- Patient can be asked to sign a coronavirus self-declaration form stating their travel history, any symptoms of fever/cold/cough/shortness of breath, etc.
- The consent form for procedure should include a statement regarding disinfection measures being taken during COVID-19 and should be duly signed by the patient before initiating any procedure.
- Fumigation should be done in the area of procedures and outpatient area daily by the end of the day.

5 | PROCEDURES

Aerosols are solid or liquid particles suspended in the air. It has been demonstrated that thermal disruption of human cells can result in release of virus/bacterial particles and these aerosolized particles if <5 μm can stay suspended in air for long time and have the potential to enter respiratory system to cause infection.¹³

Due to worldwide scarcity of PPE, not only due to coronavirus spread; but also due to misinformation, panic, and stockpiling; rational and appropriate use of PPE is very much necessary. WHO recommends that the level of protection required for a health care worker depends on the proximity to the patient and COVID status of the patient.¹⁴

Aesthetic procedures can be divided into noninvasive, minimally invasive, and invasive (Table 1).¹⁵

5.1 | Noninvasive procedures

Noninvasive procedures like superficial chemical peels and IPL result in minimal breach to skin thereby reducing the chances of aerosolization.

TABLE 1 Types of aesthetic procedures depending on the level of invasion

Noninvasive	Minimally invasive	Invasive
Chemical peeling (superficial)	Botulinum toxin injection	Regenerative aesthetic—PRP, PRF
Intense pulsed light	Filler injection	Fat grafting
Lasers—non-ablative	Mesotherapy	Liposuction
Radiofrequency skin tightening—bipolar/multipolar	Microneedling	Hair transplantation
External lipolysis (heat/ultrasound)	Microblading	Chemical peels (deep)
	Sclerotherapy	Lasers—ablative/resurfacing
	Thread lift	Dermabrasion—mechanical
	Microdermabrasion	
	Carboxytherapy	

Abbreviations: PRF, platelet rich fibrin; PRP, platelet rich plasma.

These procedures require basic caution and basic protection with N-95 mask and gloves. A N95 (as it filters 95% of airborne particles) or FFP2 or equivalent can be used.¹⁵ Gloves preferably nitrile as they are more chemical resistant, have higher puncture resistance than latex, and lesser chances of allergic reactions should be used.¹⁶

5.1.1 | How to overcome the limited supply of masks?

Due to difficulty in acquiring N-95 masks all over the world, Centers for Disease Control and Prevention (CDC) has developed few guidelines for extended use, reuse, and mask reprocessing.

Extended use: N-95 mask use can be safely extended for upto 8 hours (including between patients). Wearing a face-shield over the N-95 mask decreases the chances of soiling of mask.

Reuse: CDC recommends that assuming there is no soiling and minimal to no viral contamination the N-95 mask can be reused for upto five times with use of following strategies:

Rotation of masks—acquire a set of at least five N-95 masks and rotate their use each day assuring that there is no soiling of mask and minimal to no contamination with virus. Masks should be allowed to dry for a time period longer than the viability of the virus, that is, 72 hours. Each mask should be stored in a clean breathable paper bags separately without coming in contact with each other.¹⁵

Method approved by CDC for reprocessing/decontamination includes use of steam or liquid hydrogen peroxide. Moist heat at a temperature of 60°C to 70°C and 80% to 85% relative humidity or dry heat at 70°C for 30 minutes has been shown to adequately kill the virus while preserving the filter integrity and fit.

Use of alcohol, sanitizers, baking, microwave, boiling, ethylene oxide, or soapy water are not approved by CDC and should be

TABLE 2 Summary of the classification of procedures and level of protection

Risk level of procedure	Procedures included	Minimum level of protection
Noninvasive	Chemical peeling (superficial) Intense pulsed light Lasers—non-ablative Radiofrequency skin tightening—bipolar/multipolar External lipolysis (heat/ultrasound)	N-95 mask or equivalent gloves—Nitrile/latex
Minimally invasive	Botulinum toxin injection Filler injection Mesotherapy Microneedling Microblading Sclerotherapy Thread lift Microdermabrasion Carboxytherapy	Coverall, eye cover, gloves, and N-95 mask
Invasive	Regenerative aesthetic—PRP, PRF Fat grafting Liposuction Hair transplantation Chemical peels (deep) Lasers—ablative/resurfacing Dermabrasion—mechanical	Personal respiratory protection—Coverall, eye cover, gloves, and N-95 mask Ventilation protection with some evacuator and HEPA/UPLA filter

Abbreviations: HEPA, high-efficiency particulate air; PRF, platelet rich fibrin; PRP, platelet rich plasma; UPLA, ultra-low particulate air.

avoided as they compromises the electrostatic charge present inside the N-95 mask. N-95 is designed to capture at least 95% of particles measuring a median of 0.3 μm via mechanical and electrostatic forces.¹⁷

5.2 | Minimally invasive procedures

This category includes procedures like result in breach in the skin or mucosa thereby enhancing the chances of spread of virus through aerosolization as well via contact transmission. Hence, the level of protection should be increased. Wearing a coverall, eye cover, gloves, and N-95 mask should be the minimum level of protection before carrying out the procedures (Table 2).

5.3 | Invasive procedures

These procedures should be avoided till further guidelines from local or central governing bodies are laid down. If carried out, they should be done with extreme caution and maximum level of protection and preferably with a proper ventilation system and smoke evacuators.

There are two techniques for protection of exposed personnel; that is, use of ventilation techniques and respiratory protection via use of mask.¹⁸

Ventilation protection is most important and includes measures in general room ventilation, local exhaust, or a combination of both. Local exhaust can include smoke evacuators or wall suction systems. SARS-CoV2 particles measures ~125 nm (0.12 µm) in diameter, with smallest viral particles being 60 nm to largest being 140 nm.¹⁹ Commonly employed air filters are high-efficiency particulate air filters (HEPA) and ultra-low penetration air filter (UPLA). HEPA has an efficiency rate of 99.97% for 0.3 µm (which means that three out of 10 000 particles measuring 0.3 µm will get through the filter) whereas UPLA filters have an efficiency of 99.999 + percent for particles of size 0.12 µm. Hence, HEPA filters and UPLA filters should be employed in the set up where lasers or other plumes generating procedures are being held.¹⁸

The suction power of a smoke-evacuating system is defined by its ability to generate a threshold minimum amount of airflow. A minimum airflow of 0.012 to 0.017 m³/s was recommended by Hunter for electro cautery whereas even higher minimum airflow is required for procedures generating higher amount of plumes like laser hair reduction. A combination of charcoal filter with UPLA filter provides the best filtration.¹³

Nozzle: To obtain maximum capture of smoke, nozzle should be placed within 2 in. of the site to be treated.¹⁸

Ventilation of room: Perform procedures in an adequately ventilated room; that is, natural ventilation with at least 160 L/s/patient air flow or negative pressure rooms with at least 12 air changes per hour, and controlled direction of air flow when using mechanical ventilation.²⁰

If gowns are not fluid resistant, use a waterproof apron for some procedures with expected high fluid volumes that might penetrate the gown.

Limit the number of persons present in the room to the absolute minimum required for the patient's care and support.

Follow WHO guidance for steps of donning and doffing PPE.

Perform hand hygiene before and after contact with the patient or his/her surroundings and after PPE removal.²¹

Avoid procedures over face.

5.4 | Special precautions in handling laser machines

- Make the patient wear the gown and expose only the area to be treated
- Machine body can be covered with disposable sheet/cling film for each procedure with the exhaust fan area open
- Discard the sheet after each procedure
- Clean the body of the machine, machine tubes, articulated arm with sodium hypochlorite 1%, or 70% ethyl alcohol
- Touch screen, lens optics, and cooling tip can be cleansed using 70% ethyl alcohol.

- Use disposable spatulas. In case spatulas are to be reused, clean with 70% ethyl alcohol.
- Eye shields—should be cleaned with 70% ethyl alcohol along with the strap.
- Laser gel—take out gel in disposable cups for each procedure and discard after each procedure.
- Tattoo removal—can be postponed if not urgent
- Use low power settings where possible to reduce the production of plumes
- Ablative lasers, Q switch laser, laser hair removal generates more plumes as compared to non-ablative lasers or light emitting diodes—to be performed with proper precautions including PPE, adequate ventilation, and smoke evacuation.

5.5 | Precautions while using injectable (filler/ botulinum toxin/sclerotherapy/intralesional steroids)

- Double pair of gloves should be worn
- Area to be injected should be cleansed thoroughly
- Disposal of syringes and needles using a needle destroyer should be done immediately post procedure
- Suitable dressing to be used to seal injection points

5.6 | Precautions while doing chemical peels

- Avoid peels over face
- Superficial to medium depth peels are safer than deep
- Avoid over dryness of skin and use liberal moisturizers
- Avoid concurrent use of isotretinoin

It is important to note that the purpose of this article is to prepare the dermatologist for the precautions to be taken to restart procedures during COVID pandemic and is based on recommendations which are constantly evolving. Each case/procedure should be individually assessed and the treating dermatologist should take all precautions possible in his/her reach.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest.

AUTHOR CONTRIBUTIONS

Anuradha Jindal: main manuscript writing; Malcom Noronha: conceived the initial need of the article, editing the manuscript; Venkataram Mysore: developed the initial project and final editing of manuscript.

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