

Standard guidelines for setting up a dermatosurgery theatre

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ABSTRACT

Introduction, definition, rationale and scope: Dermatologists in India are now increasingly performing surgical and cosmetic procedures in their practice. This calls for minimum standards at the national level with the main focus of patient safety and hence the guidelines for setting up a dermatosurgical theatre. **Facility:** The dermatosurgery theatre can be created in either physician's clinic, or a hospital depending on the procedure to be performed. The dermatosurgery theatre requires careful planning with regards to – location, dimension, shell design, lighting, electrical requirements, operation table, chair, trolley, surgical instruments, sterilization of devices, asepsis and advanced life support. Apart from physical considerations, other considerations including theatre etiquettes, consent for surgery, safety of dermatosurgeon, theatre staff and lastly biomedical waste management should be looked into. These issues are discussed in detail in the recommendations.

Key words: Dermatosurgery, Office surgery, Operation theatre

INTRODUCTION

Dermatologists in India both institute based or individual practices increasingly perform surgical and cosmetic procedures, on out-patient basis. Dermatological surgery in an outpatient setting is thus an important and significant component in dermatology practice these days. These guidelines outline standard requirements for a dermatosurgery operation theatre. It is further clarified that these are minimum requirements and variations can exist in these requirements depending on the preferences of dermatosurgeons, surgeries performed, and local governmental legislations and requirements.

Definition, rationale and scope

Dermatosurgery theatre is known by different names like- ambulatory surgery centre, office based surgery centre, free standing outpatient surgery centre. This is a theatre wherein skin, nail and hair related diagnostic and therapeutic interventions are carried out, usually on day care basis. The surgical procedures range from – skin biopsies, vitiligo surgeries, nail surgery, electro surgery, cryosurgery, sclerotherapy, aesthetic procedures such as injection of fillers and Botulinum toxin, laser assisted interventions like- hair reduction, scar resurfacing, vascular lesion and pigment lesion removal to more invasive and labour intensive surgeries like hair transplantation, liposuction, blepharoplasty

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LEVEL OF EVIDENCE

Level A: Strong research-based evidence; multiple relevant, high-quality scientific studies with homogeneous results.

Level B: Moderate research-based evidence; at least one relevant, high-quality study or multiple adequate studies.

Level C: Limited research-based evidence; at least one adequate scientific study.

Level D: No research-based evidence; expert panel evaluation of other information.

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and facelifts. The requirements of a dermatologic surgery theatre would vary therefore depending on the procedure performed.

Dermatologic surgeries have certain distinct features:

- Most dermatosurgeries are outpatient based surgeries and do not need hospital admission, thus avoid the stress and infection risk associated with a hospital admission.
- Dermatologic surgeries often do not need the same level of theatre preparation as would systemic surgeries.
- Dermatosurgery theatre avoids major operation theatre (O.T) red tapism.
- Flexibility of scheduling patients
- Dermatologic surgeries, being outpatient surgeries costs less to the patient than major O.T.
- Traditional hospital operation theatres (O.T.) are geared for extensive inpatient surgeries and may not be suitable for many of the dermatologic surgeries.

Facility

- Most dermatologic interventions are performed through intact skin with only resident bacterial flora. Dermatologists do not perform aesthetic surgeries on an infected skin. However keeping in view the transient flora and environmental contaminants, proper aseptic precautions at the operation field is essential.
- Usage of local anesthetic agents in the injectable form requires caution with regards to hypersensitivity reactions such as anaphylaxis and vasovagal attack and therefore emergency resuscitation equipment and procedures must be in place.
- The instrumentation required for surgery are basic – operation theatre table, operation theatre light, sterile surgical drapes and appropriate sterile instruments and advanced life support devices, wash basin all housed in an appropriate clinically sterile enclosure- here in after called dermatosurgery operation theatre.

RECOMMENDATIONS

Dermatosurgery theatre- location

Level of Evidence- Level-B

- The dematosurgery theatre may be housed in a major hospital or private clinic premises or in shared premises with common theatre shared by different doctors– plastic surgeons, general surgeons or likeminded dermatologist willing to do

group practice.^[1,2]

- The dermatosurgery theatre could be housed in the above location – in unrestricted or restricted area. In unrestricted zone, patients in street cloth can enter the theatre, while in restricted zone –hair cover, face mask surgical attire and slippers for both patient and doctor are required.^[3]
 - A) Dermatosurgeries which can be done in unrestricted zone are cryosurgery, electrosurgery, chemical peels, fillers, botulinum toxin chemodenervation, laser assisted hair reduction and fractional photothermolysis.
 - B) Dermatosurgeries in restricted zone are hair transplantation, ablative lasers, dermabrasion, vitiligo surgery and liposuction

Dermatosurgery theatre -dimensions

Level of Evidence- Level- B

The centre stage of the theatre is the operating table occupying at least 6 feet in length. In the eventuality of the surgeon having to resuscitate the patient, additional 3 feet is required at the head end. The same applies to the foot end. So the length of the theatre should be minimum 12 feet. The breadth may be 10 to 12 feet.^[4]

However, other views have been expressed as follows, keeping in view of the space constraints in major cities:

- 10 x 10 feet^[5]
- 12 x 12 feet^[6]
- 12 x 15 feet^[7]

The taskforce, after considering the above evidence, and also the situation in India, would like to recommend the minimum size of dermatosurgery theatre to be 12 x 12 feet.

- The height of the theatre should be around 10 feet.^[8]

Dermatosurgery theatre -shell planning

Level of Evidence- Level-B

- Door: The door should be preferably of width- more than 24 inches. This is to facilitate the movement of trolley, in case of emergencies. The door should be made of opaque material. This is to prevent transmission of laser light –in case the theatre is using laser in surgery.^[9] The door should have a sign board - laser in use and its wavelength (For further details please refer –taskforce guidelines on laser procedure room).
- Floor: The floor should be of easily washable material such as concrete or marble tiles.^[10]

- Windows: Windows should be protected so that insects and animals do not enter the premises.^[4]
- The windows should be covered with opaque material when lasers are being operated.^[9] Air conditioning is a recommended option, but not mandatory. (See taskforce guidelines on- laser procedures room.). Lamellar air flow is not required for dermatosurgery theatre and instruments can be made to clear the floor space. The depth of the cabinets may be around 1 foot.^[7]
- Wash basin should be provided with hand disinfectant dispenser and tap with long handle.
- Since tap water contains infectious organisms, provision for UV filtration and or boiling, should be considered.
- Provision for a preparatory room to change slippers and dress change room, both for patient and staff, should be planned if advanced dermatosurgeries are being performed.

Dermatosurgery theatre- lighting

Level of Evidence- Level-C

General lighting in the theater by fluorescent lamp mounted flush with the ceiling is adequate.

- Fluorescent lamp – at the rate of 1 W per square foot (i.e., for 120 square feet-120W- 3 tubes of 40W).^[11] Ceiling or Pedestal lighting of the operation field.
- Shadow less lighting delivering 3,000- 8,000 foot candles.^[12] (i.e., the dental chairs have halogen lamp of 50W power. Each Watt of power will give 50 foot candle of illumination at the site of surgery. So a 50W of halogen bulb can roughly give 2500 foot candles of illumination on the site of surgery)

Dermatosurgery theatre -electrical requirement

The dermatology surgery theater requires careful planning with regards to three pin sockets, keeping in view with the instrumentation [Table 1].

Table 1: Electrical requirements in dermato-surgery theatre

Volts	Current	No of 3 pin sockets	Devices
220V	5 amps	6 in numbers	1. Electro surgery unit 2. Dental chair if it is electrically operated. 3. O.T. light if it does not have internal wiring. 4. Microdermabrasion/ micro motor or tattoo gun 5. Radio/ Television. 6. Some lasers.
220V	15 amps	1	Table top autoclave.
220V	15 amps, 3kVA	1	Some lasers and skin coolers.

Preferably no extension cords should be used in the theatre. Circuit breakers are added advantage.

- Always use servo stabilizers for costly equipments.
- Online UPS is always desirable in the Indian situation, where continuous power supply is not assured, so that operation time is not lost. Generators are also desirable.
- Fire extinguishers are a necessity when using electrosurgery units or lasers. Emergency telephone numbers of fire services should be maintained and displayed prominently.

Dermatosurgery – operation table, chair and trolley

Level of Evidence- Level-C

- Standard operation table or dental chair are appropriate, with some additional requirements:
- Dimension- 6 feet length, 22- 24 inches breadth
- Provision for back and foot elevation, head support, hand rest and height adjustment ^[13]
- The maneuverability of the operation table may be mechanical- foot and hand operated or electrically operated with finger tip or foot control.
- The surgeon's chairs should have adequate back support with foot support and movable with wheels.
- Stainless steel trolley of dimension- 38 x38 cm, with wheels to hold the procedure instruments. Mayo table is another option.
- Waste bin – metallic/washable with lid and polythene disposable bag inside.

Dermatosurgery- surgical instruments

The surgical instruments depend upon the type of work and individual surgeon's preference.^[13-15] The below list is not comprehensive and consists of basic requirements for a functional theatre [Table 2].

Specific instruments may be needed according to individual surgeries, for which the reader may consult individual chapters on procedures in major textbooks.

Dermatosurgery- sterilization and disinfection of operation theatre and instruments

Level of Evidence- Level-B

- The operation theatre need only be clean of dust and organic matter.
- Daily in the morning the floor, the operation table, chair, light, shelves and sink should be wet mopped free of dust, with water. Note, avoid using broom which could aerosolize the dust. Use of detergent or chemical disinfectant for floor is optional, unless one is planning - dermabrasion,

Table 2: Dermatosurgery instruments

Forceps	Sharp instruments	Scissors	Miscellaneous
Cheatles	Bard parker handle no 3, 4 and 5	5 inch blunt and sharp (Lister).	Skin hooks
Sponge holding	Disposable surgical blades no- 11, 15	Iris scissors	Needle holder-Halsey and box type.
Adson-non toothed	Disposable punches	Castroviejo	Nail splitter.
Adson toothed	Comedone extractor		
Mosquito artery	Curette of 3and 4 mm diameter.		
Spencers suture removal			

skin grafting, hair restoration or liposuction. The wet mop later should be put in a proper place to dry.

- The operation theatre trolley should be mopped with a chemical disinfectant or isopropyl alcohol before surgery and between two surgeries.
- The floor and other areas of blood spillage should be mopped with chemical disinfectant or chlorine bleach.
- Cleaning the walls, ceiling need to be cleaned periodically.
- Use of fan in the operation theatre should be avoided as it causes aerosolization of dust.
- If there is an air conditioner, maintenance of the same is necessary.

Fumigation

When invasive surgeries such as hair restoration, liposuction, complex closures, laser resurfacing etc, are being carried out, fumigation should be done daily or prior to each surgery.

- Formalin fumigation overnight either using a fumigator or formalin in a galipot is sufficient.^[16] Or else, 500ml of,40% formalin in 1000ml of water, for 1000cu feet of operation theatre area - in an electric boiler/fumigator is the ideal concentration. Non irritating fumigants like peracetic acid could also be considered.

The theatre linen and instruments may be sterilized or chemically disinfected.

- All blood soaked linen and instruments should go through the following cycle:

1. Clean with tap water
2. Disinfect with hypochlorite bleach for 30 minutes
3. Wash with household detergent at 71°C for 25 minutes.

Later they can be sterilized or disinfected.^[17] Natural suture material and needle should be washed in sterile saline and later soaked in chemical disinfectant for 1 hour and later washed before reuse.

- Autoclaving: Table top model is usually adequate for *galipot*, *trays* at 121°C for 15 minutes, pressure of 2.4 bar in porous stainless steel containers.^[18] (Instrument to be used the same day or pack in polythene bag for use upto 8 weeks).
- For sharp instruments like *scissors*, *curettes*, *electrosurgery electrodes*, chemical disinfectant is used as per Table 3.

Dermatosurgery- asepsis

Level of Evidence- Level-B

- For curettage and shave biopsy a disposable latex or vinyl glove is sufficient.
- For electro surgery, microdermabrasion and suture surgery the dermatologist can wash their hands with a disinfectant –chlorhexidine, iodine scrub lotion or alcohol. When using bar soaps, keep the soap in a dry tray as moisture promotes bacterial growth even in bar soaps. If alcohol scrubs are used, the hands should be dry before alcohol solution is applied and once the alcohol is applied wait till it is dry before donning a glove. Alcohol

Table 3: Chemical disinfectants and their uses

Chemical used	Quantity required	Time for disinfection	To be changed	Comment
Formalin in chamber	7g of formalin for one cubic meter area at 20°C. (1g tablet available)	12 hours	Daily	- For disinfecting electrosurgery electrodes and cables. - For disinfecting sharp instruments Note - It is an irritant and carcinogen.
Glutaraldehyde	2.45% concentration	20 minutes ^[9]	14 days	- For disinfecting sharp instruments
Isopropyl alcohol	70%	2 minutes	Daily	Caution- Inflammable near lasers and electro surgery units.

will not work on wet hands as disinfectant. The above method will prevent bacterial growth below the gloves for extended period of time during surgery. This can prevent contamination of the surgical field in the event of tear of gloves. Note- Donning a sterile glove without washing of hand is not recommended.^[19]

- For skin resurfacing, punch grafting, hair restoration, liposuction, complex closures, hand scrubbing for 2 minutes with surgical scrub up to elbow is a must.
- Skin preparation of the patient with povidone iodine 5% w/v is sufficient. But for povidone iodine to be effective, it should be left on the skin of the patient for at least 2 minutes. Alcohol should not be used when using electro surgery unit or lasers.

Dermatosurgery- advanced life support

As per government of India regulation and Supreme Court verdict all personnel in the operation theater should be familiar with basic and advanced life support.^[9] Basic life support does not require any devices or drugs. A standby anesthetist may be necessary for certain procedures such as hair transplantation and liposuction. It is always preferable to maintain liaison with a local hospital with ICU facility.

Advanced life support requires the availability of drugs and devices as shown in Table 4.

Dermatosurgery theatre- etiquettes, patient safety and occupational hazards

- Staff must respect and maintain the dignity of the patient.
- Patients' privacy and modesty should be respected by all staff at all times.
- Patient must be explained in detail of the diagnosis, anesthesia planned, pain involved, and instrument being used- like either laser or electro surgery, post operative care-including the necessity of dressing, sunscreens or antibiotics, complications expected and their remedy. If the patient is receiving oral sedation, the necessity of an attendant after surgery should be informed. The cost of the therapy should be explained.^[20]
- Use of mobile telephone in the operation theatre should be restricted.^[21]
- A dermatosurgery register book and folder for consent form should be maintained.

Patient safety

- Before administering local anesthetic agents-

Table 4: Advanced life support devices and drugs

Devices	Quantity
Ambu bag	1
Laryngoscope with different size blades	1
Endo tracheal tube of different size	1
IV Cannula-adult and pediatric	2
Drip set	2
Air way of all size	1
Stethoscope	1
B.P. apparatus	1
Cardiac monitor with built in defibrillator	1
Oxygen cylinder with connectors	1
Suction device	1.
Disposable syringe	2
Drugs	Quantity
Adrenaline- 1.1000	5
Atropine- 0.6 mg	5
Sodium bicarbonate ampoules	2
Chlorpheniramine maleate 22.75 mg/ml, 2cc	2
Hydrocortisone 100 mg/ml	2
Aminophylline 250 mg/2 ml amp	2
Dopamine 200 mg/5 ml	2
Normal saline 500 ml	2
5% Dextrose Normal	
Saline 500 ml	2
Mephentermine 15 mg/ml	5
Dextrose 25%	2 ampoules

- obtain history of xylocaine hypersensitivity
- Usage of beta blockers, aspirin, vitamin e or Ginkobiloba.^[22]
- Before electrosurgery
 - obtain history of cardiac pace-makers^[23,24]
 - ensure proper contact of return electrode to prevent burns at this site
 - application of diathermy grounding plates in accordance with the manufacturer's instructions, i.e. applied to a clean, dry, hair free, muscular area, as close to the operation site as possible, away from any pre-existing metal work in the patient.
 - diathermy grounding plates must be kept clean and dry, and preventative measures taken to ensure the plate does not become soiled with prep solutions or body fluids.
 - remove metallic ornaments from the operation site.
 - avoid surgical spirit preparation solution
 - use caution when operating near the orbit.
 - never pass electrical cables over the patient.
 - never draw power from extension board or multipoint plug adaptors.

Table 5: Treatment and disposal of biomedical waste

Category	Description of waste	Container color code with logo	Treatment and disposal
4	Waste sharps- Blades, Needles	Blue	Chemically disinfect with hypochlorite solution for 12 hours ^[33] and later shred
6	Soiled waste- Blood stained gauze, Surgical dressing	Yellow	Incineration
7	Solid waste- Gloves, Syringe, I.V. Tubings.	Red 	Chemically disinfect with hypochlorite solution for 12 hours ^[33] later shred

- before electro surgery- switch the device on and steam the active electrode tip in saline soaked gauze until all the tissue debris is removed. Also after the surgery repeat the same. This ensures minimum disinfection, but autoclaving or formalin fumigation in chamber should be considered, because steaming alone does not ensure disinfection.^[25,26]
- Before laser surgery
 - Insist on patient wearing cotton clothes or drape the operation field with cotton hole towels.
 - Protect the eye by using appropriate eye wear externally or intraocular metallic eye shield when operating near the eye.^[27]
 - Avoid surgical spirit preparation solution.

Dermatologist and operation theatre nurse safety

- Before electrosurgery
 - wear surgical mask
 - wear protective gloves
 - use smoke evacuators when working on verrucae or large epidermal nevi
 - wear latex or vinyl glove- but this will not prevent electric shock, due to the phenomenon of capacitative conductance.
- Before laser surgery
 - wear appropriate eye protection glass of correct wave length, optical density.
 - wear surgical mask. Cotton fibre mask are not that very efficient. The pore of the mask should be less than 1.0 micron. The mask should be covering the nose and mouth, and not hanging around the neck. Never put the used mask in your apron pocket.^[28]
 - use smoke evacuator to suck out laser plume which can contain HPV and other viruses or potent carcinogens and lung irritants. The plume can cause methaemoglobin and carboxyhemoglobin in operator. The smoke evacuator is not ordinary house hold vacuum suction units, but with specific attributes- suction unit or pump, filter, hose and inlet

nozzle. The capture velocity of about 100-150 feet per minute at the inlet nozzle. The filter should be High efficiency particulate air filter- HEPA. The inlet nozzle should be held about 2 inches above the operation site.^[29-32]

- Operation theatre safety
 - avoid recapping of needles
 - wear protective rubber gloves when washing instruments.

Dermatosurgery- biomedical waste management

Dermatologists generate three variants of biomedical waste. The management of this waste is guided by the rule of Central pollution control Board, Government of India, Ministry of environment, which calls for mandatory registration with appropriate authorities for pollution control and waste disposal. Specific instructions may vary from state to state and physician is advised to consult the concerned authorities in their respective states

There are two aspects of management-

- Segregation of the biomedical waste
- Safe disposal of the biomedical waste.

Each dermatologist can segregate the waste at source into leak proof and puncture proof high density plastic container with polythene bag inside to be used to dispose. The biohazard logo should be on the container and bag. Later this can be handed over to either- hospital waste management team or individual dermatologist in remote areas and peripheries can organize their safe disposal as per recommendations in Table 5.

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