

# STANDARDIZED CLINICAL PROTOCOLS

## Sterilization Protocols



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## **STANDARDIZED STERILIZATION PROCEDURE**

### **Pre operative preparation of the patient:**

- Patient is allowed inside the block room after washing thoroughly their face and legs with soap
- Caps and shoes are worn.
- The eyebrows and lids are cleaned thoroughly with **10 % Povidone Iodine**.
- After block, one drop of 5% of Povidone iodine is instilled.
- On the table prior to surgery, again the eye is cleaned thoroughly with 10% Povidone Iodine and one drop of 5% of Povidone Iodine is instilled.

### **Hand Scrubbing:**

Principle: To wash from a clean area (hand) to less clean area (arm).

#### **Methods:**

1. Hand to be first washed with ordinary tap water + medicated soap (Liquid), followed by scrubbing with chemical disinfectant. To use boiled cooled water subsequently for hand wash and not tap water
2. Chemical disinfectants (**Povidone iodine liquid scrub or 20% Chlorhexidine**) to be used twice on each occasion for 3 min (Rub and avoid using brush)
3. The staff & surgeons are all required to use surgical gloves, which after being worn are cleaned by using sterile autoclaved water or cotton balls soaked in sterile water to remove glove powder.

**The water can be boiled using a stainless steel drum fitted with a electric coil. The drum should be tightly closed with a lid and also fitted with a tap, so that the sterility of the water can be maintained. The water should be boiled at least 8 to 10 hours earlier, so that the temperature will be right enough for hand washing.**

Alternatively water from an AquaGuard can be used – however the quality of the water should be monitored periodically.



**Precautions:**

**a) During Surgery**

- Should see that observers keep a distance; do not allow them to stand behind you.
- Should keep sharp instrument on towel such that tip is facing up.
- Do not poke the instruments on to the towel.
- Plastic disposable drapes be used preferably
- Do not touch sutures/IOL, any instruments to lid margins.

**b) Between Cases:**

- Change the gloves after every case, including the assisting nurse.
- Alternatively, apply 2.5% Chlorhexidine hand rub and change the gloves after 5 cases or if comes in contact with unsterile surface

***Do not use rectified spirit either as hand rub or for cleaning instruments. The sterility of the commercially available spirit is questionable.***

**No. of surgical sets needed**

One surgeon with one OT table : 4 sets

One surgeon with two OT tables : 7 sets

One junior surgeon with one OT table : 2 sets

The standardization of number of sets was done to have enough number of surgical sets to allow time for autoclaving the surgical instruments in between the surgeries.

**I. Instruments: Preparation of Instruments for Sterilization**

- i) Separate the sharp instruments from the blunt instruments.
- ii) Instruments should be cleaned as soon as possible after their use, especially simcoe cannula.
- iii) Instruments should be thoroughly cleaned by washing in sterile distilled water.  
**Bodedex forte solution** (Bode- Germany) can be used for effective cleaning.  
Alternatively surf powder can be used.



- iv) After removing the instruments from ultrasonic cleaner, it is washed in four basins containing mineral water; dried with sterile towel; tipped with plastic sleeve and packed in the individual trays
- v) A clean toothbrush should be used to clean the instruments.
- vi) Instruments should be placed in a tray with perforated bottom to allow steam penetration around the instruments during autoclaving.
- vii) Size of instruments pack should allow space for steam penetration in the drum
- viii) Place the tray inside a bin after spreading the towel inside.
- ix) Gloves must be worn while handling the instruments to avoid infective material & cuts.
- x) All the instruments should be cleaned with ultrasound cleaner once a week. Canulated instruments are cleaned daily.

**Packing the surgical bin:**

Place a cotton towel before placing the instruments

Don't pack the bin fully

Normally 3 tapes (bottom, middle and top-within the drums) are placed.

The indicator tapes should be kept in a daily register to monitor the quality of sterilization.

**A) Blunt Instruments**

**Method of Choice: General Autoclave:**

Safe method of sterilization, as it kills bacteria, spores, viruses, fungus. Indicator tape should be used in every cycle. **Normally 3 tapes (bottom, middle and top-within the drums) are placed.**

Items	Pressure	Temperature	Time
Blunt Instruments dressing, glass, silicon materials, Linen vessels	20 pound	121°C	45 Min
Rubber items	20 pound	121°C	45 Min
Liquids	20 pound	121°C	30 Min



**Note: Autoclaved instruments should be used within 48 hours**

The water should be drained out daily to avoid settling of salt on the instruments and in the chamber. The autoclave should be serviced once in 6 months

**Mode of sterilization during surgery in between Cases:**

**Autoclaved for 10 minutes – Flash or high speed autoclave**

The instruments are cleaned in clean sterile water or distilled water. The canulas should be cleaned separately with RL solution.

The cleaning water should be changed after cleaning 4 or 5 sets.

**Mode of sterilization of instruments in between surgery:**

Autoclaved for 20 minutes – single drum autoclave (electrical). As enough no. of surgical instrument sets will be made available, the practice of boiling should be discontinued. The instruments will be cleaned using clean mineral or boiled tap water and a clean brush. The cannulated instruments should be flushed with sterile saline / RL solution. The instruments are then placed back in the instrument tray. The trays are placed inside the surgical drum, which can hold upto 6 sets. The drum is placed in the autoclave and it will take twenty minutes for the autoclaving to be over. The whole process for cleaning and sterilizing six sets will take about 20 – 30 minutes.

**B) Sharp Instruments (Including razor blade)**

As for blunt instruments prior to surgery as well as in between cases

**Alternative Methods for sterilization of sharp instruments**

**Chemical sterilisation:**

**i) Prior to surgery:**

- 1) All the four trays used for keeping Cidex solution and sterile water should be autoclaved before using.
- 2) Sharp instruments to be kept in activated solution of Cidex (**2% Glutaraldehyde**) for 8 hours and then washed 3 times with sterile water, kept in the three trays.

**ii) Between Cases**

- Keep in Cidex for 15 minutes. Again wash 3 times with sterile water.



- The same solution can be used for 2 weeks. Preferably should be changed weekly.
- The sterile water should be changed everyday.

**Preparation of Instruments (Cidex)**

- 1) Wash and dry the instruments carefully.
- 2) Place the instruments in a tray.
- 3) Add Cidex to the instruments tray.
- 4) Make sure all the instruments are completely immersed in the Cidex.
- 5) Cover the tray and let the instruments soak for 8 to 10 hours.
- 6) Before use, the instruments should be rinsed thoroughly with sterile water.
- 7) The solution may be used upto 14 days after activation.
- 8) After every day use, the solution should be filtered before storage.
- 9) Record the date of mixing on the side of tray.
- 10) Sterile water tray should be prepared daily.

**C) Cryoprobe, Vitrectomy Cutter, Cautery wire**

- To be kept in formalin chamber for 24 hours.
- An eye pad soaked with liquid formalin is used and changed the next day.
- Clean the tip of the cautery probe with razor blade.

As these instruments are heat labile, these can be sterilized using formaldehyde.

A stainless steel drum with closely fitting lid can be used as the formalin chamber. The instruments are placed inside the drum. Two eye pads are placed inside the drum and are soaked with liquid formalin (30 ml). Alternatively formalin tablets also can be used. The chamber is kept closed overnight, atleast for a period of 12 hours. Fresh cotton pads should be used daily.

**Alternate method - Ethylene oxide (Gas Sterilization)**

- Remove all lubricants from instruments.
- They should be absolutely dry.
- Pack them in polythene bag with indicator tape inside the bag.



**D) Sutures:**

Ideally suture should not be re-used. In case if they are reused the following procedure should be followed.

1. The suture thread should be wound around a cotton ball and placed in the instrument tray for autoclaving as described above. However there is no need to clean the suture.
2. Alternatively the suture bit can be re-sterilized using the Cidex solution as described under the chemical sterilization protocol. If only for this purpose, three small cups can be used instead of the trays. These should be stainless steel cups and should be autoclaved and kept in the surgical trolley itself. In one cup the Cidex is kept and in other two sterile RL solution is kept. The suture should soak in the Cidex at least for a period of 10 minutes. After which it should be soaked for few seconds in the RL solution to remove all the Cidex .

**E) Linen:**

1. All dresses washed with detergents.
2. Washing should be done in a designated area. Avoid common bathrooms
3. Caps and masks are autoclaved.
4. Aprons and drape sheets to be washed with detergent, dried in covered area and autoclaved in a loosely packed, separate drum with an indicator strip pasted.

**Note:** No one should be allowed to enter the theatre with street clothes.

**F) Irrigation Solutions:**

- Should use bottle containers, rather than plastic
- Check clarity of solution and also look for suspended particles.
- Check for leakage and quantity of solution
- Ideally the bottle container should be autoclaved.

*With plastic container it is difficult to assess the clarity of the solution. Very often with cluster infections, the irrigating solutions were the source of infection. Hence*



*it is advisable to re-sterilize these solutions in the hospital to ensure sterility. For these purposes the glass containers are more ideal.*

**H) Viscoelastic:**

- Viscoelastics are preferably autoclaved before surgery.
- The left over is neither re-autoclaved nor reused in the operating rooms.

**I) Theatre Sterilization:**

**Operating room & Corridors:**

1. Daily OT floor is swept thoroughly and then mopped with tap water containing **0.5% Benzalkonium chloride** (Microl – F , 1:10)
2. After washing, formalin fumigation is done at least once a week; theatre should be closed for 24 hours.
3. Corridors are fumigated with formalin.
4. Complete cleaning of the theatre including walls, door, and floors is done daily with diluted **0.5% Benzalkonium chloride** (Microl – F , 1:10)
5. Block room, changing room, doctor's room must be cleaned daily three times with **0.5% Benzalkonium chloride** solution (Microl - F)

**J) Equipments:**

1. Fans, light, clocks inside the theatre are wiped once a week. With diluted 0.5% of Benzalkonium chloride (1:10)
2. Equipment like microscopes should be cleaned separately with 15% Cetrimide and 3 % Chlorhexidine gluconate (**Instruclean**) daily, except lens.
3. 0.1% Ethanol, 0.1% 2-Propanol and 0.06% 1-Propanol mixture (**Bacillol 25 spray**) is used to clean the head of the microscope daily. Lenses should be cleaned once a week with lens cleaning solutions.

**K) Furniture:**

1. Tables, saline stands, revolving chairs (surgeon seat) should be cleaned daily with diluted 0.5% Benzalkonium chloride (**Microl – F**) or antiseptic liquid concentrate





(Chlorhexidine gluconate 7.5% - 10 ml should be diluted with 500ml of water or 10% Benzalkonium chloride ).

**L) Air conditioning Unit and Water tank:**

1. Air conditioner filter must be cleaned once in a week.
2. Water tank should be cleaned with Bleaching powder once in two months.

**M) Microbiological evaluation:**

1. Periodic culture is done once in a month from areas such as hand wash, Saline, Cannula, Boiled Water, Distilled Water and Swabs are taken from Surgeon's hands, Assistant's hands, floors, walls and air conditioner for culture once in 15 days. ( must for a new theatre; optional otherwise)

**N) Others:**

1. Slippers for toilet use and theatre are kept strictly separated.
2. Slippers are daily washed with detergent and dried.
3. Theatre boys to be instructed to change the dress before leaving the theatre as well as Slippers.
4. Stretchers used in & out of theatre must be separated.
5. Keep the doors of theatre always closed.
6. Garbage should be disposed after each OT session.

**O) OT Personnel:**

The OT must have a dedicated steam of paramedical and cleaning staff

**Ideal Number of Supporting Staff for 1 Surgeon operating on 2 tables:**

Personnel	Number
Assisting nurses	2
Circulating nurse	1
Sterilization	1
Block Room Nurse	1
Cleaning Staff	1



**P) Out patient department:**

- Instruments tray should be autoclaved daily.
- Instruments once used in OPD must be autoclaved.
- Instruments used on infective cases are kept in **Cidex** for 10 hours prior to being cleaned, and is autoclaved twice before use.
- Disposable products should be strictly disposed.
- Slit lamp should be cleaned with handrub solutions after an infective case is seen and routinely every day.
- Floors should be swept thoroughly and then mopped with 0.5% chlorine solution mixed with detergents (disinfectant cleaning solution) at least 3 times a day.
- Eye drops should be kept capped.

**Q) Wards:**

- Floor swabbing to be done daily with 0.5% chlorine solution mixed with detergents (disinfectant cleaning solution)
- Instrument trolley should be cleaned everyday. A separate trolley should be kept for dressing infective cases
- The drops should be kept clean and the tip of the dropper should not be touched
- The hands should be washed before applying any medication
- The slit lamp should be cleaned everyday

